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THE UNIVERSITY OF ALBERTA

BREASTMILK: THE EMIC PERSPECTIVE OF MOTHERS

by

Joan Lorraine Bottorff

A THESIS

SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF NURSING

FACULTY OF NURSING

EDMONTON, ALBERTA

FALL 1988

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled BREASTMILK: THE EMIC PERSPECTIVE OF MOTHERS submitted by JOAN LORRAINE BOTTORFF in partial fulfillment of the requirements for the degree of MASTER OF NURSING.

Janice M. Morse
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Vergie Bergum

Date: June 20, 1988

To my mother, Lorraine Bown, who truly nurtures

the children who surround her.

ABSTRACT

This study examined belief systems related to breastmilk from the perspective of breastfeeding mothers. The study was conducted using the method of ethnoscience. Interviews with nine mothers who had experience breastfeeding were the major source of data.

The findings from this study indicate that mothers hold significant beliefs related to breastmilk as a food and the process of lactation as a body function. Mothers' descriptions of breastmilk indicated their awareness of the biomedical benefits of breastmilk for their infants; however, several mothers were concerned about the appearance of their milk. Variations in quantity appeared to be closely monitored by mothers. For most mothers, the quality of milk was assumed to remain relatively stable throughout their breastfeeding experience. However, some mothers believed that the maintenance of strict health practices, particularly related to diet, was necessary to ensure the milk was "good." Areas of contradiction in mothers' attitudes toward breastmilk were identified. Mothers' perceptions of their role in managing their milk supply was elucidated and included: 1) mothers' perceived influence over the quality and quantity of their milk, 2) ways to influence the quantity of milk, 3) ways to influence the quality of milk, 4) working on finding a balance, 5) dealing with drips, and 5) relieving the discomfort of milk. Finally, the perceived emotional and physical costs and pay-offs of producing and giving breastmilk were described.

Mothers' belief systems related to breastmilk in developed countries has not previously been reported. Further investigation is required to understand the degree to which the perspectives identified in this study are held by other groups of mothers in Canada. New insight gained by understanding mothers' perspectives of the benefits of breastmilk and factors influencing its quality and quantity could be used to guide changes in a variety of

interventions aimed at supporting and maintaining breastfeeding. Developing culturally appropriate interventions can contribute to the well-being of both mothers and babies.

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I. INTRODUCTION

Statement of the Problem

Since the 1950's, concentrated efforts have been undertaken to increase the incidence and duration of breastfeeding. While initiation rates for breastfeeding have increased considerably in Canada, many women terminate breastfeeding shortly after leaving hospital. For example, Yeung, Pennell, Leung and Hall (1981) found that of the 71% of women who were breastfeeding at the time of discharge from hospital 40% continued for three months, and only 21% were still breastfeeding six months later. These findings are similar to those of other studies (Clark & Beal, 1982: Ellis & Hewat, 1984; Fieldhouse, 1984; Jones, West, & Newcombe, 1986; Lai, Garson, & Hankins, 1982; Tanaka, Yeung, & Anderson, 1987). Similar trends in other developed nations have also been identified by Underwood, Arsdell, Blumenstiel and Scrimshaw (1981). These trends have stimulated an interest among nurses in designing interventions to enhance the success of breastfeeding experiences in order to increase the duration of breastfeeding (Jones & West, 1986; Mandik-Hall, 1978; Princeton, 1986). Although the importance of understanding the mother's perspective in planning these interventions has been recognized (Harrison, Morse, & Prowse, 1985), the basis on which mothers make infant feeding decisions is not clearly understood.

While most mothers could be expected to adopt feeding practices that will ensure their infants are well nourished, there is a dearth of literature on their beliefs related to infant foods and the influence of these beliefs on infant feeding choices and practices. In particular, researchers have largely ignored mothers' belief systems related to breastmilk and the adequacy of breastmilk as an infant food in their investigations. On the other hand, the literature is replete with descriptions of the benefits of breastmilk by professionals and the details of nutritional, immunological, bactericidal and economical benefits of breastmilk

(Jelliffe & Jelliffe, 1978) have lead to characterizations of breastmilk as the "perfect or complete food" (Berg, 1977), a "natural resource" (Weinstein, 1980), and a "potent medicine" (Behar, 1976). While the advantages of breastmilk may seem to be self-evident to the many professionals who describe the position of the scientific medical and nutritional culture, there appears to be less certainty when the perspective widens to accommodate the views of the wider community. Despite the strong arguments for breastfeeding, artificial feeding continues to supplant breastfeeding in many parts of the world, including Canada. Discrepancies in perspective between professional groups and mothers/community are also apparent in the appropriate timing of additional foods for breastfed infants. Wide variations in the timing and type of supplemental foods given to infants have been documented (Kusin, Kardjati, & van Steenbergen, 1985), including recommendations that such foods not be introduced before four months or later than six months (Underwood & Hofvander, 1982).

Despite the efforts of researchers to identify a wide variety of factors associated with the initiation, maintenance and early termination of breastfeeding (including women's attitudes toward breastfeeding) belief systems with respect to breastmilk as an infant food have not been systematically examined. Understanding the cultural ideology that surrounds the use of human milk would give meaning to the value of mother's milk as an infant food, including factors thought to influence the quality and quantity of milk. An increased awareness of these beliefs is necessary to facilitate the development of culturally appropriate interventions to encourage and maintain breastfeeding.

Purpose and Rationale

The purpose of this research is to identify and describe belief systems related to breastmilk from the perspective of breastfeeding mothers. Pelto (1981) describes beliefs as cultural statements of what "is" and what "ought to be" which are associated with folklore handed down through passing generations. In addition, within each generation people develop and use various perspectives to bring order into their worlds (Geertz,

1973). For example, the limitations of scientific theory, including use of the biomedical model, in explaining health and healing have lead individuals to seek alternative explanations of certain life experiences, often labeled folk beliefs (Roberson, 1987). Increasingly, the importance of folk definitions of physical and mental health for understanding patients' explanatory models of illness is being recognized by health professionals (Kleinman, Eisenberg, & Good, 1978). Beliefs and rituals concerning breastfeeding, however, have been largely ignored in developed countries. By understanding the cultural ideology that underlies a set of practices, such as those related to the use of breastmilk, it is possible to make sense of the meaning that actions and events have for participants (Schieffelin, 1985). Women may continue or stop breastfeeding for reasons that are sound for them even though the reasons may lack a scientific basis or be contradictory to current medical opinion (Fernandez & Guthrie, 1984). Because little is known about mothers' beliefs related to breastmilk, an inductive factor-isolating approach is necessary (Diers, 1979). This investigation is designed to ellicit the emic perspective of breastmilk and to develop an ethnography of the cultural meaning of breastmilk.

Understanding mothers' belief systems related to breastmilk as an infant food and the influence of this belief system on breastfeeding practices could make an important contribution to interpreting this behavior. New insight gained by understanding mothers' perspectives of the benefits of breastmilk and factors influencing its quality and quantity could be used to guide changes in a variety of interventions aimed at supporting and maintaining breastfeeding. For example, beliefs which are sound according to current scientific knowledge could be used to support breastfeeding. Strategies could be developed to modify or reduce those beliefs that work against successful lactation. Developing culturally appropriate interventions can contribute to the well-being of both mothers and babies.

Research Questions

The original research questions were as follows:

1. In what ways do mothers describe and evaluate human milk as an infant food?
2. How do mothers define the benefits of breastmilk?
3. How do mothers recognize and influence changes in the quality and quantity of breastmilk?
4. How do mothers determine when breastmilk is no longer necessary?

As the study progressed an additional question evolved which guided data collection and analysis. It was: How do mothers describe the experience of producing milk in relation to themselves as women and as mothers?

II. REVIEW OF THE LITERATURE

Beliefs related to breastmilk have not been systematically or extensively examined in the research on infant feeding practices in developed countries, including Canada. The purpose of this review is to present a summary of existing knowledge on beliefs related to breastmilk and to demonstrate a rationale for this study. Literature relevant to this topic were found primarily within journals and books dealing with nursing, behavioral sciences and dietetics. The review will be organized around four areas: an historical perspective of perceptions of breastmilk, current knowledge of mother's beliefs related to breastmilk, food preferences and the relationship between beliefs and feeding practices.

Historical Perspective of Perceptions of Breastmilk

The transformative mysteries of women have come to be recognized as the "blood mysteries" of menstruation, pregnancy and lactation (Neumann, 1955). The transformation of blood into milk has captured the imagination of both men and women from the earliest times. Women, too, have been typified as givers of nourishment, the clearest expression of this outward giving being the breast. According to Greek tradition, the first bowl was modeled from Helen's breast. Neumann (1955) describes in detail the multiplication of the breast motif over centuries and the symbolism of milk and cow that the motif involves. For example, in Egyptian mythology, the Great Goddess, as celestial cow, nourished the earth with her "milky rain" (p. 128). In a similar way, breasts were symbols of the nourishing life stream in the Cretan culture. The high regard for lactating women is also implied by the wealth of images of mother goddesses, often shown holding or suckling an infant. Neumann summarizes the significance of women's ability to lactate by stating that, "the Feminine, the giver of nourishment, becomes everywhere a revered principle of nature, on which man is dependent " (p.131).

Apparent in historical accounts of infant feeding is the high value placed on breastmilk as a food for the young, and this value is reflected in the practices and prescriptions to

ensure the quality and quantity of milk. For example, based on evidence from Egyptian medical papyri dating back to the 16 century BC, Fildes (1986) suggests that spells, potions and incantations were used to increase milk supply, to protect milk and to recognize and remedy bad milk. Breastmilk was also included in many oral remedies and local applications for a variety of conditions. The practice of wet nursing seemed to be well-known in ancient civilizations. Even the story of the discovery of Moses in the Old Testament includes a search for a wet nurse. From historical records, it is clear that wet nurses were carefully chosen to ensure that the milk was of good quality. In some ancient civilizations, prohibition of sexual intercourse during lactation was based on the fear that it could harm the milk.

Early philosophers also demonstrated an interest in lactation. For example, Aristole's descriptions of the duration of lactation and its connection to menstruation received comment until well into the 18th century. These ideas were significant in that "together with the belief that breastmilk was formed from the menstrual blood which was not shed during pregnancy, it was advised for centuries that women were never to be employed as wet nurses if they were menstruating or pregnant; because their milk would be 'spoiled' and/or insufficient for the child" (Fildes, 1986, p.20). While Roman philosophers believed breastmilk to be the healthiest and most suitable food for infants, they were also against the use of wet nurses. The Romans believed that characteristics of the nurse were transferred to the infant through the milk and they were concerned that the bond of affection between a mother and her child would diminish, possibly causing problems in later life. Breastmilk was of such great importance that writers of this time described in detail how to evaluate the quality of the milk, listed the ideal characteristics of a wet nurse and outlined prescriptions for maintaining a good supply of milk.

Between the 16th and 18th centuries, medical and religious writers emphasized that mother's milk was better than milk from any other source and recommended that an

infant's mother was the best nurse. Reasons for recommending maternal breastfeeding were often tied to important beliefs concerning the qualities of milk. Fildes (1986) states:

> Two important beliefs were associated with the milk: i) That the characteristics of the women or animal were transmitted through their milk into the child; ii) That breast milk was the blood which had fed the child in the womb and was converted into white blood in the breasts once the child was born. Thus the mother's milk was the same blood which had nourished the child in the womb, with which it was familiar, and which obviously suited it. Therefore it was best for the child to continue to be nourished by the same blood. (p.112)

Concern for the health of the infant remained until the latter part of the 18th century. At this time, the main reason for breastfeeding shifted to preservation of a mother's health.

Some writers from the 16th to 18th century also described the qualities of good breastmilk as they related to consistency, color, taste and smell. The majority thought the milk should be of medium consistency. Fildes (1986) explains:

> The reasons for this preference were that thick milk was unnatural and evil, indicating that something was wrong with the blood, and was difficult for the child to digest, so that it became lean and feverish. Milk that was too thin and serous was regarded as 'raw' and passed too quickly through the child without nourishing it sufficiently. (p.183)

The ideal color of milk was thought to be white. Colored milk was thought to be due to defects in the blood or emotional states of the mother (e.g., blue milk was indicative of melancholy). Towards the end of the 18th century, physicians began to show a preference for milk of a thinner consistency and bluish white in color. Fildes (1986) suggests that the commencement of more detailed and scientific observations of breastmilk in the 18th century may account for this change. Writers had more difficulty judging the quantity of breastmilk, and most simply thought that the breasts should feel full. Changes in breastmilk during the duration of lactation were also discussed. As Fildes (1986) explains the 'age' of the milk was of particular interest :

> The reasons given by 18th century writers for not employing a women who had ben lactating for several months were four-fold. It was believed that breastmilk became thicker and more indigestible the longer a woman lactated, until it stopped altogether; and woman who had been lactating for several months would be unlikely to have sufficient to nurse another child for the required length of time, and the child would therefore have to be weaned early, or a second nurse might have to employ later; the

> quality of breastmilk was said to decline after about a year; and 'old milk' did not agree with the newborn. (p.176)

Fildes concludes from a review of the writings of 17th century midwives that the principal causes of lactation failure were understood. However, writers did not appear to relate remedies to causes. The moisture some plants provided were believed to increase the moisture in the body and, "by sympathy," the amount of milk. A strong belief in the lactogenic properties of fennel was also common. Associations of properties of whiteness, moisture and nourishment with the production of milk appear to be the basis of prescribing various white substances, such as milk thistle and milk stones, to aid lactation. Similarly, consumption of various parts of the cow was probably related to its ability to produce abundant quantities of milk. Fildes (1986) includes a quotation from Jane Sharp, a midwife writing in 1671. Sharp comments:

> Some prescribe the hoofs of a cow's forefeet dried and powdered, and a dram taken every morning in ale: I think it should be the hoofs of the hinderfeet, for they stand nearest the udder, where milk is bred. (p.137)

The interest and concern about breastmilk over centuries and civilizations is suggestive of its importance as an infant food. When this milk was essential for survival of the infant, rituals and practices appear to have developed to ensure an adequate supply of breastmilk . Although Fildes (1986) has provided a detailed historical account of infant feeding, of which important ideas related to breastmilk have been summarized here, it must be kept in mind that the ideas presented are primarily those of the "experts" of the day rather than of mothers themselves. As science attempts to unfold the mystery of lactation, one might expect that folk beliefs and practices related to breastmilk to change. Yet for modern mothers, like mothers in the past, the process of lactation remains hidden from view. Gussler and Briesemeister (1980) suggest that many of the rituals and practices of the past may still be practiced to varying degrees because an adequate flow of good quality milk can be disrupted by factors mothers do not fully understand. The loose and discrete nature of these beliefs makes it possible for mothers to adopt modern ideas while still retaining their

folk ideas. Just as most people accept the germ theory of disease while retaining folk concepts such as "chills" and "fevers" (Helman, 1978), many women may hold a mixture of modern and traditional outlooks.

Current Knowledge of Mothers' Beliefs Related to Breastmilk

Few investigations have focussed on mothers' perspectives of breastmilk. Some quantitative studies have described maternal beliefs and attitudes toward breastfeeding in relation to maternal sources of information and support (Axelson, Kurinij, Sahlroot, & Forman, 1985) and feeding practices (Arafat, Allen, & Fox, 1981; Gabriel, Gabriel, & Lawrence, 1986; Morse, Sims, & Guthrie, 1979; Reamer & Sugarman, 1987). In these studies, a limited examination of attitudes and beliefs toward breastmilk has been included. However, use of a variety of forced-choice questionnaires in all but one of these investigations makes any comparison of results difficult. In addition, the fact that mothers' responses were limited by the number and nature of items related to breastmilk and that they were not given an opportunity to elaborate or explain their responses limits the usefulness of this information.

Other problems in using quantitative approaches to study mothers' perceptions of breastmilk are evident in the work of Gabriel et al. (1986). They interviewed mothers using a semi-structured questionnaire. The authors believed that by asking questions such as "Why is the bottle better for the baby?" they would determine if women considered artificial feeding to be better than breastmilk and whether nutritional and health benefits were attached to bottle feeding. The question did not elicit beliefs as to the unique benefits of artificial formula. Instead, mothers talked about why they could not breastfeed. Although the researchers realized during the study that mothers shifted the focus of their answers and checked to see if this was due to misunderstanding the question, they did not rephrase the question or probe informants to obtain information on their beliefs regarding the benefits of artificial formula or breastmilk. Use of qualitative research methods would

have provided researchers with the opportunity to correct problems such as this while still in the data-gathering phase of the research (Roberson & Boyle, 1984).

Only two quantitative studies were found to specifically focus on the benefits of breastmilk as perceived by mothers. In the first study, however, subjects were asked to select alternatives from a list of common benefits of breastmilk derived from the literature (Ojofeitimi, 1981). Rather than revealing mothers' perceptions of the benefits of breastmilk, the results reflect mothers' awareness of these views. In a study by Weller and Dungy (1986), mothers were asked to rank a list of verbatim responses obtained from open-ended interviews to identify the preferred characteristics of infant feeding methods. These researchers found that whether women bottle-fed or breastfed they wanted a feeding method that allowed their infants to grow up healthy, protected infants from getting sick, allowed them to feel close to their babies, provided all the vitamins and nutrients needed and ensured their babies would feel full and satisfied. While the preference for breastfeeding demonstrated in this study suggests that breastmilk is viewed as fulfilling these requirements, exploration of mothers perceptions of breastmilk per se were not elicited.

Qualitative studies which investigate aspects of women's perceptions of breastmilk can be divided into two groups. The first group of studies has explored mothers' concerns related to breastfeeding (Chapman, Macey, Keegan, Borum, & Bennett, 1985; Morgan, 1986; Wallace,1980). Although concerns expressed by breastfeeding mothers included 'insufficient milk' and beliefs that milk did not look 'rich enough' or 'strong enough,' these were not explored in any depth. It is, therefore, unclear as to how these concerns fit into women's belief systems related to breastmilk as an infant food.

The second group of qualitative studies has explored beliefs related to breastmilk in the wider context of beliefs dealing with breastfeeding practices and lactation. Study samples have primarily been women in traditional societies or non-western countries. However,

these studies do offer some insight into the diversity of beliefs surrounding breastmilk and its use as an infant food.

Differences in beliefs as to the value of breastmilk have been documented between some groups. For example, Indian women believe cow's milk to be superior to breastmilk (Evans, Walpole, Qureshi, Memon, & Jones, 1976). This belief is also shared by some Anglo, Cuban and Puerto Rican women surveyed in the United States if a lactating mother is unhealthy or poorly nourished. They believe that these mothers should not lactate because the milk would be harmful for the baby (Bryant, 1982). For some Haitian women living in Florida, canned milk has several advantages over breastmilk. It is more easily stored, and there is "no chance of getting 'mother's disease'" (DeSantis, 1986).

Beliefs in the superiority of breastmilk are also reflected in different ways. For example, the importance of breastmilk is reflected in Iranian women's beliefs that the infant's personality, moral, traits and habits are influenced by a mother's milk (Niehoff & Meister, 1972). Whereas, the women in Mali, West Africa believe that only breastmilk can make a child heavy, healthy and strong (Dettwyler, 1987). Amongst the Amele of Papua New Guinea, the value of breastmilk increases as children age. These women believe that liquid foods are most suitable for small children. As a result, little supplementary food is offered to infants during the first year (Jenkins, Orr-Ewing, & Heywood, 1985). Mothers in Mit-Salama, Egypt see the value of breastmilk by comparing it to cow's milk. They believe breastmilk is cleaner and cheaper and that their breastfed babies grow bigger and are healthier than those fed cow's milk (Rapheal & Davis, 1985). Mali women also hold the opinion that breastmilk is the ideal food for producing strong and healthy infants, and in addition, they view breastmilk as an essential biological link between a woman and her children (Dettwyler, 1987). Interviews with Anglos, Cuban and Puerto Rican women living in the United States revealed that these women viewed the benefits of breastmilk primarily in terms of the infant's well-being. Comments related specifically to breastmilk were: "breastmilk is more complete", "it's pure," "it is healthier for the baby," and

"breastmilk is made especially for humans" (Bryant, 1982, p. 1761). Although other investigators provide further evidence that the beliefs of breastfeeding mothers in Canada and the United States primarily focus on the benefits of breastfeeding for their infants (Adair, 1983; Ellis & Hewat, 1984; Gabriel et al., 1986; Hewat & Ellis, 1984; Mohrer, 1979; Yeung, et al., 1981), these researchers have not focussed their research specifically on mother's perceptions of breastmilk.

In several cultures, taboos against the use of colostrum as an infant food are evident, even though breastmilk is valued. In some instances, colostrum has been described as a worthless, repulsive, weak or impure form of milk not suitable for the child to digest (Burns, 1981; Chowning, 1985; de Gonzálas, 1963; McGilvary, 1982; Morse, 1984). However, some women consider colostrum to be just "what is in the breasts before the true milk comes," neither bad or good for the infant (Dettwyler, 1987, p. 636).

In some Pacific societies, the meaning of food has more to do with affective associations than with nutritional values. Breastmilk as an infant food is not exempt from this. Gegeo and Watson-Gegeo (1985) state that "even when an infant seems completely satisfied with cow's milk, care givers say that it is dissatisfied, any signs of discomfort are attributed to the absence of maternal love associated with breastfeeding" (p. 245).

A variety of beliefs have also been reported related to factors influencing the quality and quantity of breastmilk. For example, Filipino (Fernandez & Guthrie, 1984) and Mali women (Dettwyler, 1987) believe that milk can become stale if it stays in the breast too long. In contrast, Igorot mothers in the Philippines believe that breastmilk changes as the baby grows older, making it unsuitable for younger infants (Raphael & Davis, 1985). They also assume that what the mother eats is passed on to the baby. Some women believe that emotions from the mother are transmitted to the baby via breastmilk. For example, Cuban women in the United States believe that anxiety caused by a hectic life style can turn their milk bad and make a baby sick or nervous (Raphael & Davis, 1985). Spanish-speaking Hispanics believe that a mother's anger can do damage to the baby

through the milk (Weller & Dungy, 1986). Dietary restrictions and prescriptions to ensure the quality and quantity of breastmilk are also common (Burns, 1981; Conton, 1985; Coughlin, 1965; Goldsmith, 1984; Fernandez & Guthrie, 1984; Pelto, 1981; Ragheb & Smith, 1979).

Food Preferences

The complexities involved in food preferences are reflected by the fact that food is "at once an absolutely basic requirement of life, a source of great pleasure, a potentially dangerous source of toxins and pathogens and a medium for the expressions of socio-cultural values" (Fallon & Rozin, 1983, p.15). Biological biases and culture provide a framework within which individuals evaluate substances as to their edibility and desirability as food. One would expect, therefore, that infant food preferences and infant feeding practices are significantly influenced by culture.

A wide range of beliefs related to food and nutrition have been documented (de Garine, 1972). Although several studies describe food preferences and rejections, few have included any reference to human milk. Fallon and Rozin (1983) investigated the psychological basis of food rejections by humans in a survey of students in the United States. Students were asked to describe their reactions to each of seventeen potential foods (e.g., washed green grass, dog meat, warm cow's milk, human mother's milk). Surprisingly human milk was classified along with grass and dirt as an "inappropriate" food. This suggests that the subjects rejected breastmilk because they do not consider it a food. This contrasts somewhat to their previous study (Rozin & Fallon, 1980), where human milk is classified as a "disgusting food". On the basis of the *idea* of what the substance was, breastmilk was viewed as offensive and distasteful. These findings are consistent with Wicke's (1953) suggestion that western values of ultra-cleanliness and avoidance of human secretions contribute to consideration of breastmilk as an "unclean bodily discharge." These attitudes toward breastmilk as a food are a cause for concern, especially when attempts are being made to encourage breastfeeding.

The Relationship Between Beliefs and Feeding Practices

While the role of beliefs or values in structuring behavior is not always clear (Pelto, 1981), there is some evidence to suggest that beliefs related to breastmilk can have an important influence on breastfeeding practices. Guthrie, Guthrie, Fernandez and Estrera (1983) observed that women in the Philippines often stopped breastfeeding or failed to initiate nursing for reasons that reflected pre-scientific thinking. The belief that a mother's anger or grief may be transmitted to the baby by way of milk (Fernandez & Guthrie, 1984) or may "spoil" the breastmilk (DeSantis, 1986) has been known to cause a mother to stop breastfeeding if she becomes upset. Belief systems can also contribute to anxiety or provide support for nursing mothers. Attitudes and fears can lead to emotional distress, which can influence lactation and interrupt the let-down reflex (Newton & Newton, 1948). Mothers' experiences of "too little milk" frequently lead to the introduction of other infant foods or early termination of breastfeeding (Clark & Beal, 1982; Ellis & Hewat, 1984; Goodine & Fried, 1984; McIntosh, 1985; Tully & Dewey, 1984; West, 1980; Winikoff, Laukaran, Myer, & Stone, 1986; Yeung et al., 1981). Attitudes and beliefs can also serve to support nursing, such as belief systems related to maintenance of an adequate milk flow (Fernandez & Guthrie, 1984). In designing programs to support breastfeeding, it would, therefore, be important to take into account the belief systems of the target group.

Summary

A review of the literature reveals that studies investigating beliefs about breastmilk among Canadian women are virtually non-existent. Despite recognition of the significance of understanding the cultural context of infant feeding practices and the cultural influence on food preferences, mothers' perceptions of breastmilk have been largely ignored. Researchers have reported that 'insufficient milk' is a very common concern among breastfeeding mothers in Canada (Ellis & Hewat, 1984; Wallace, 1980). However, beliefs about breastmilk as an infant food, including the benefits of breastmilk and the factors thought to influence the quality and quantity of human milk, have remained largely

unexplored. Understanding the belief systems that surround the use of human milk can give meaning to the value of mother's milk as a food, as well as, mothers' practices while breastfeeding. This literature review has indicated the variety of beliefs held by different groups about breastmilk as an infant food. Research that examines the beliefs of Canadian women that surround the use of breastmilk as an infant food will add to this existing cross-cultural body of knowledge and provide necessary information to facilitate the design of culturally appropriate interventions to support breastfeeding in this country.

III. METHODS

The purpose of this study was to examine breastmilk from the perspective of breastfeeding mothers, that is, how did they conceptualize and describe breastmilk, what benefits did they attribute to breastmilk, what beliefs did they hold related to the quality and quantity of breastmilk, how did they use breastmilk and how did producing breastmilk influence their lives as women and mothers. Because it was necessary to explore first hand informants' own ideas and beliefs, about which little is known, the ethnoscience method was used.

Ethnoscience

Ethnoscience is a linguistic and anthropological research method designed to discern "how people construe their world experience from the way they talk about it" (Frake, 1962, p.74). This method provides a formal and explicit way to study culture by focussing on language use. The usefulness of the ethnoscience method in enriching understanding of cultural factors related to health and illness issues that are important to nursing has been described by Leininger (1969, 1985a) and Evaneshko and Kay (1982). Using the principles and procedures of ethnoscience, the cognitive world of a cultural group, or the emic perspective can be discerned. In keeping with this intent, it is necessary for the researcher to enter the investigation with very few assumptions. The researcher's approach, therefore, is also emic and it is assumed that individuals will inform the researcher of primary issues and concepts that are relevant to the researcher's interest (Osborne, 1977). In this study, the emic perspective of mothers concerning breastmilk was systematically elicited, documented, classified and interpreted using ethnoscience methods.

Sample. Statistical sampling techniques were not appropriate as the goals of this research included the initial description of a little known phenomenon (i.e., beliefs related to breastmilk) and explication of meaning rather than the distribution or relationship

between variables (LeCompte & Goetz, 1982; Morse, 1986). To obtain the most insightful data possible, informants in this study were selected according to their ability and receptivity to provide rich enough data to allow the researcher to discover the cultural ideology that surrounds the use of breastmilk. This method allowed selection of subjects to be based on research needs and maximized the researcher's access to representative data which contributes to understanding and insight. The following qualities were used to guide selection of informants:

1. currently breastfeeding or has breastfed,
2. able to and willing to articulate thoughts and feelings regarding breastmilk,
3. expresses relative comfort with being interviewed and tape recorded,and
4. displays an interest in participating in the study.

Table 1

Biographical Characteristics of the Informants

	Characteristics					
Informants	Age	Education	Occupation	No. of Children	Length of BF Experience	Currently BF
1	34	Post Sec.	Nurse	2	9 mo.	yes
2	41	Gr. 12	Housewife	4	9 years	yes
3	29	Gr 12	Housewife	1	5 mo.	yes
4	31	Gr. 12	Housewife	2	2 years	yes
5	31	Gr. 12	Housewife	2	8 mo.	no
6	28	Post Sec.	Counsellor	3	2 years	no
7	35	Post Sec.	Student	1	9.5 mo.	no
8	21	Gr. 11	Housewife	2	4 mo.	no
9	23	Gr. 12	Housewife	1	2 mo	yes

In selecting informants, an attempt was made to maximize the homogeneity of the group by including only English speaking middle class Canadian born women. However,

to ensure depth and breadth of the researcher's understanding of mothers' perspective of breastmilk, the informants were selected to include a range of ages and breastfeeding experiences. Nine informants were selected and interviewed in this study. A biographical sketch of the sample is presented in Table 1.

Data Collection. The primary method of data collection used in ethnoscience is indepth interviews in the "native" language. Initial interviews were designed to elicit broad descriptive data. For example, interviews were commenced by asking informants to talk about their impressions of breastmilk the first time they saw it. Formal elicitation procedures (Evaneshko & Kay, 1982; Spradley, 1979) were used to encourage informants to provide culturally relevant data. In this way, the researcher was able to reassure informants that their ideas and responses were valued more than those of the researcher or other professionals. This interview strategy also provided a forum for posing questions based on the informant's world view, and for the use of exploring and probing techniques to help the informant clarify, explain or elaborate ideas in ways that were meaningful to him or her. All interviews were tape-recorded and transcribed verbatim. Data gathered from interviews were augmented with field notes completed after each interview.

Permission to use data transcribed directly from semi-structured interviews collected as a part of a separate project investigating how mothers manage breastfeeding and work (Morse, 1988) was obtained. The project included sixty-one breastfeeding mothers who participated in monthly telephone interviews until they weaned or for a period of one year, which ever came first. Access to statements relating to breastmilk was facilitated by the fact that the data for this project had been entered and coded on the main frame computer. Statements retrieved from this data base were treated as data from secondary informants. These statements were, therefore, used to verify data obtained from the nine informants in this project and to identify areas that required further exploration.

Analysis of the first round of interviews, in conjunction with data from secondary informants, resulted in the development of categories and provided direction for second

round interviews. Second round interviews were more structured, with an increased use of direct questions and card sorts to validate and extend understanding of the structure of data from the informants' point of view. Using these techniques, analysis completed with the first round of interviews was verified, gaps in areas of the interviews were filled in, cross-checking with informants was made possible and the development of taxonomies was facilitated. Informants sorted cards on types of breastmilk, descriptions of breastmilk, ways of managing breastmilk and lactation, and kinds of experiences that related to producing breastmilk. The researcher kept a journal to record experiences, impressions and decisions as the research was being completed. In addition, notes related to analysis and interpretation were kept.

Data Analysis. The primary goal of ethnoscience is richness of the data, which serves as a basis for an indepth descriptive analysis of a domain of knowledge. Several strategies were incorporated to facilitate the achievement of this goal. Interviews were transcribed verbatim and checked for accuracy by reviewing the tape and the transcript. Notes were added to the margins of the transcript to identify significant para-linguistics (e.g., changes in tone of voice). In conjunction with field notes, data were educed from these transcripts.

Analysis commenced with data obtained from initial interviews. First level coding was completed by writing notations of significant words, phrases or underlying assumptions in the margins of the initial transcribed interviews. Categories were then developed on the basis of these notations. Once initial categories were identified, transcribed interviews were coded and data sorted using *The Ethnograph*, a computer program designed to facilitate analysis of qualitative data. The initial categories that were used to code data were: 1) characteristics of breastmilk, 2) production of breastmilk, 3) mothers' experiences during lactation, and 4) baby's response to breastmilk.

Analysis became more focussed as the data were collected. Towards the end of the first round of interviews and during second round interviews, possibilities for sorting data within these broad categories became apparent. As recoding of interviews was

cumbersome with *The Ethnograph*, resorting, within the broad categories, was done by hand on the basis of interview data and searches for universal semantic relationships (Spradley, 1979). For example, the category relating to breastmilk was subsequently resorted into descriptions related to colostrum and to mature breastmilk, reflecting the different kinds of milk that mothers recognized. Then, on the basis of further analysis and card sorts, data within each of these sub-categories was finally sorted into physical, nutritional and medicinal characteristics. Categories and themes, therefore, were derived literally from the interview transcripts.

Other strategies were also used to facilitate data analysis. Field notes were continuously reviewed for potential sources of biases and inconsistencies in the data. Memos were kept during the process of analysis to record new ideas, impressions and tentative hypotheses. These were reviewed frequently throughout the study to extend thinking about the analysis. Statements from secondary informants related to breastmilk were continually compared to data collected from informants to verify and extend analysis. In addition, the structure and meanings of categories were verified with informants using contrast questions, Q-sort, diadic and triadic card sort techniques.

When variations in beliefs systems between informants were recognized, they were explored and verified with informants. As a consequence, observed variations that became apparent during data collection and analysis were reflected through the use of description and, where necessary, diagrammatically displayed using a typology to enhance conceptual clarity. It is important to note that in interpreting typologies no attempt was made to determine the numbers of persons in each cell or the amount of a particular factor present (Stern, in press). As with taxonomies, behaviors and/or beliefs in this study were classified, not individuals (Glaser, 1978).

Discussions with professional colleagues and members of the thesis committee during the period of data analysis and the experience associated with writing the results of this

investigation stimulated further thinking about the analysis. This resulted in further refinement of categories and the establishment of clearer links between data.

Reliability and Validity

The goal of qualitative investigations is the discovery of human phenomena or experiences as they are lived and perceived by subjects (Sandelowski, 1986). To this end, it is the researcher's responsibility to elicit and provide an accurate rendition of the phenomenon being investigated, while conscientiously recognizing and balancing factors which enhance the credibility of the research (LeCompte & Goetz, 1982). The following section will address issues of reliability and validity as they relate to the context of this research.

Optimum reliability and validity in qualitative research are significantly influenced by the selection of a sample. The criteria of appropriateness and adequacy have been suggested by Morse (1986) for evaluating sampling strategies used in qualitative research. A non-probability sampling strategy was used in this study to enable the researcher to purposefully select informants in order to maximize the likelihood of obtaining the most insightful data possible. In this way, access to representative data which contributed to understanding mother's beliefs was achieved, thereby meeting the criteria of appropriateness. Informants were sought on the basis of their personal experience with the topic of breastmilk by virtue of their involvement in breastfeeding and their receptivity to sharing their experiences. The sample was obtained in the following way: one informant responded to an old advertisement for a breastfeeding study but on finding she was too late, agreed to participate in this project; the researcher was introduced to six breastfeeding mothers by subjects participating in another study and professional colleagues; and the remaining two informants were contacted after receiving their names from informants already participating in this project. Four women were not breastfeeding at the commencement of the study. Summative totals of breastfeeding experience ranged from two months to nine years. The informants were all able to provide detailed experiential

information related to breastmilk and lactation. They all believed that they could recognize changes in the quantity of their milk supply, and several had observed changes in the quality of their milk. Informants were also able to relate experiences of other breastfeeding women.

The second criteria used to evaluate sampling in qualitative research is that of adequacy. Morse (1986) defines adequacy in terms of the quality, completeness and amount of information provided by informants. In this study, sampling ceased when no new information was being collected, information given was repetitive and a sense of understanding mothers' perspective of breastmilk was achieved. These indicators suggested saturation was achieved (Morse, in press a). Adequacy of the data was supported when comparative data was obtained from secondary informants participating in another research project.

In order that the rigor in this qualitative research be achieved, several other strategies were adopted to enhance reliability and validity. In qualitative research, validity refers to gaining knowledge and understanding of the true meaning of the phenomenon under study (Leininger, 1985b). The more time the researcher spends with a group, the more opportunities for continual data analysis and comparison to refine constructs such that a match between the categories developed by the researcher and the informants' reality is achieved (LeCompte & Goetz, 1982). The principal investigator was the sole interviewer in this project and was responsible for data analysis. This extensive involvement in the project enhanced this process.

Criteria for evaluating the validity of qualitative research have been described by Sandelowski (1986). She suggests that credibility and fittingness are more appropriate criteria than the familiar standards of internal and external validity that are applied to quantitative research. A qualitative study is credible when it presents such "faithful descriptions or interpretations of a human experience that the people having that experience would immediately recognize it from those descriptions or interpretations as their

own...and when other people (other researchers or readers) can recognize the experience when confronted with it after having only read about it in a study"(Sandelowski, 1986, p.30). Fittingness refers to the "fit" of qualitative findings outside the context of the study situation, including the ability of audiences to find meaning and applicability of the findings in terms of their own experiences. Strategies that were incorporated into this study to minimize threats to credibility and fittingness were founded on the researcher's intention to develop constructs that were derived from and congruent with actual data collected during the process of this research. Information obtained from one informant was verified by asking others about the same content. This form of concurrent validation served to enhance the accuracy of data collected. Frequent checks for representativeness of the data as a whole and of coding categories were completed. Examples were used to reduce and present data. To correct for bias or distortion and to confirm and validate interviews, data from secondary informants were used. Finally, the researcher obtained validation from the informants themselves through card sorts and direct questioning to ensure that categories were meaningful and reflected the informants' reality. Further determination of whether this study meets the credibility and fittingness criteria must await the reaction of others when the results of this study are disseminated.

In qualitative research where the uniqueness of human situations is emphasized, reliability cannot be achieved to the degree that would be expected in quantitative research. However, rigor relating to consistency of qualitative findings is enhanced when the events of the research process are clearly described and justified (Lincoln & Guba, 1985; Sandelowski, 1986). Accurate recording of all events, decisions and procedures used as the research unfolded enhanced the researcher's ability to carefully report the "decision trail" used in this study and delineate the physical, social and interpersonal contexts within which the data were collected.

In qualitative research, the researcher, as a person, can significantly influence data collection and how the data are interpreted. Hence, the researcher needs to be aware of the

influence of personal biases (Dobbert, 1982), personality, cultural background and use of self (Lipson, in press) on the research process. These factors undoubtedly influenced this investigation. I introduced myself to informants as a nurse interested in collecting the "wisdom" of breastfeeding mothers related to breastmilk. Although I made a conscious attempt to be non-judgmental and open to what mothers had to say and to recognize that they were the "experts" in this investigation on the basis of their personal experiences of breastfeeding, at times, the fact that I was known as a nurse, and possibly an "expert," appeared to influence the interaction during interviews. For example, mothers' comments suggested on occasion that they thought their answers were being evaluated. My own personal beliefs in the value of breastfeeding, interest in women's health and willingness to accept others as they are have influenced this project in many ways. These attitudes, for example, facilitated discussion during data collection. Mothers appeared to feel comfortable sharing their ideas with me, trusting that their comments would be accepted with respect. When mothers were unsure of their experiences or expressed concern about the "correctness" of their responses, I often tried to offer some reassurance, for example, by stating, "It's difficult to really know for sure." These attempts to relieve anxiety may have discouraged further exploration of these concerns. As I became more confident with the interviewing strategies used in this investigation, I was able to probe significant statements more effectively and direct questions to issues mothers felt less comfortable talking about with greater ease. I soon discovered that the most relaxed and productive interviews took place around kitchen tables over cups of tea.

When informants asked what other mothers had thought about particular topics I shared this with them and noted their reaction. I purposely tried to avoid giving "scientific" information or using medical terms to maintain a focus on what mothers believed to be significant. Yet I felt uncomfortable withholding information that I held when mothers directed their questions to me. In these instances, I attempted to redirect questions by asking what they had heard from others or made the suggestion that they

contact their doctor or community health nurse. This left some informants notably puzzled. These situations undoubtedly influenced the researcher-informant relationship in subtle but significant ways.

The influence of the researcher on data analysis and interpretation needs to be also considered. The impact of my background as a nurse, previous experience in other breastfeeding research projects and interest in understanding women's perspective of health related concerns must be recognized.

Ethical Considerations

To ensure the ethical standards of this investigation, consideration was given to obtaining consent, maintaining confidentiality and maintaining anonymity. Written consent was obtained from the informants for the study (see Appendix A and B). Each informant was given an explanation of the project and was told what would be expected of her. Informants were told that all interviews and observations would be kept confidential and that the sole purpose of the information was for the stated study. Refusal to participate, the right to refuse to answer any question and the right to withdraw at any time were respected. During the course of the interviews, if mothers asked for advice or information about breastfeeding, they were referred to their family physician, pediatrician or public health nurse.

Anonymity was maintained by using identifying codes on all tapes and transcripts during the course of the study. Names inadvertently taped during the interviews were blanked out in the transcripts. In the final report, quotes from informants remained anonymous, and if necessary, other identifying information was altered.

At the conclusion of the project, identifying code lists, names and address of subjects were destroyed. As all informants agreed to the use of their tapes and transcripts for educational and further research purposes, the data collected in this study will be retained by the researcher and stored in a secure place until no longer needed.

IV. FINDINGS

"There isn't really much you can say about breastmilk." This informant's statement summarizes the initial reaction of the mothers in this study when they were asked to talk about breastmilk. Mothers eager to describe their breastfeeding experience expressed reservation about being able to share much about the milk per se. Some found it difficult to talk about breastmilk in isolation from breastfeeding. While breastmilk was considered an important infant food, mothers explained that they rarely saw it and knew little about how it was actually produced by their bodies. They were unable to determine how much milk the baby was drinking and, for mothers who did not express, examination of the milk was limited to brief glimpses of milk on their baby's lips or dripping from their breasts and observation of partly digested milk "burped up." Most of the time, breastmilk remained invisible. Therefore, mothers' experiential knowledge and beliefs related to breastmilk emanated from not only their direct observations of milk (when this was possible) but, more importantly, from indirect observations of the milk through awareness of their own bodily experiences of producing and giving milk and the responses of their infants. In this way, mothers either validated the things that they had heard or read about concerning breastmilk or made discoveries from their own experiences. Mothers shared this experiential knowledge as well as their beliefs about breastmilk with other breastfeeding mothers. However, the beliefs of older women who had little or no breastfeeding experience were usually viewed as "old wives' tales." When mothers had concerns or problems with their breastmilk they viewed other experienced breastfeeding mothers as the experts they should consult.

Descriptions of Breastmilk

While some mothers referred to the milk as "mother's milk," others simply talked of breastmilk. To all mothers it was "milk." But not always something as concrete as that. For example, one informant stated:

> I look at it more in abstract terms; that is, I mean I know its there and I can see it and feel it and all the rest of it. I think of breastmilk as something that is good for my baby....I see it in such an abstract way. And yet it couldn't be more concrete, could it? [327, 1.1]

In order to understand these mother's view of breastmilk, the informants were asked to describe the characteristics of breastmilk. This descriptive question was asked in various ways. For example, the investigator initiated discussion on first reactions to seeing breastmilk and used card sorts. From analysis of explicit and implicit comments from the nine informant's a list of their descriptions of the characteristics of colostrum and breastmilk was developed and is presented in Figure 1.

Colostrum

Although there was some disagreement as to whether it or not it was milk, all mothers knew about colostrum. For some mothers, colostrum represented the "first milk," to others it was the precursor to "actual milk." They described colostrum primarily in terms of its preventative function—as a "concentrated" and "rich" supply of antibodies, an "immunization package." Several mothers believed that its nutritional value was less than actual milk but sufficient enough to keep the baby satisfied until the milk came in. Only one mother explained that colostrum had a laxative function which was important in"getting things moving and working." Descriptions of the colostrum itself varied from "thick, kind of yellowish" to "very thin and very bluish in color." Differences are likely due to the gradual transition that occurs between the production of colostrum and mature breastmilk and, therefore, the timing of these observations. The "thickness" of the

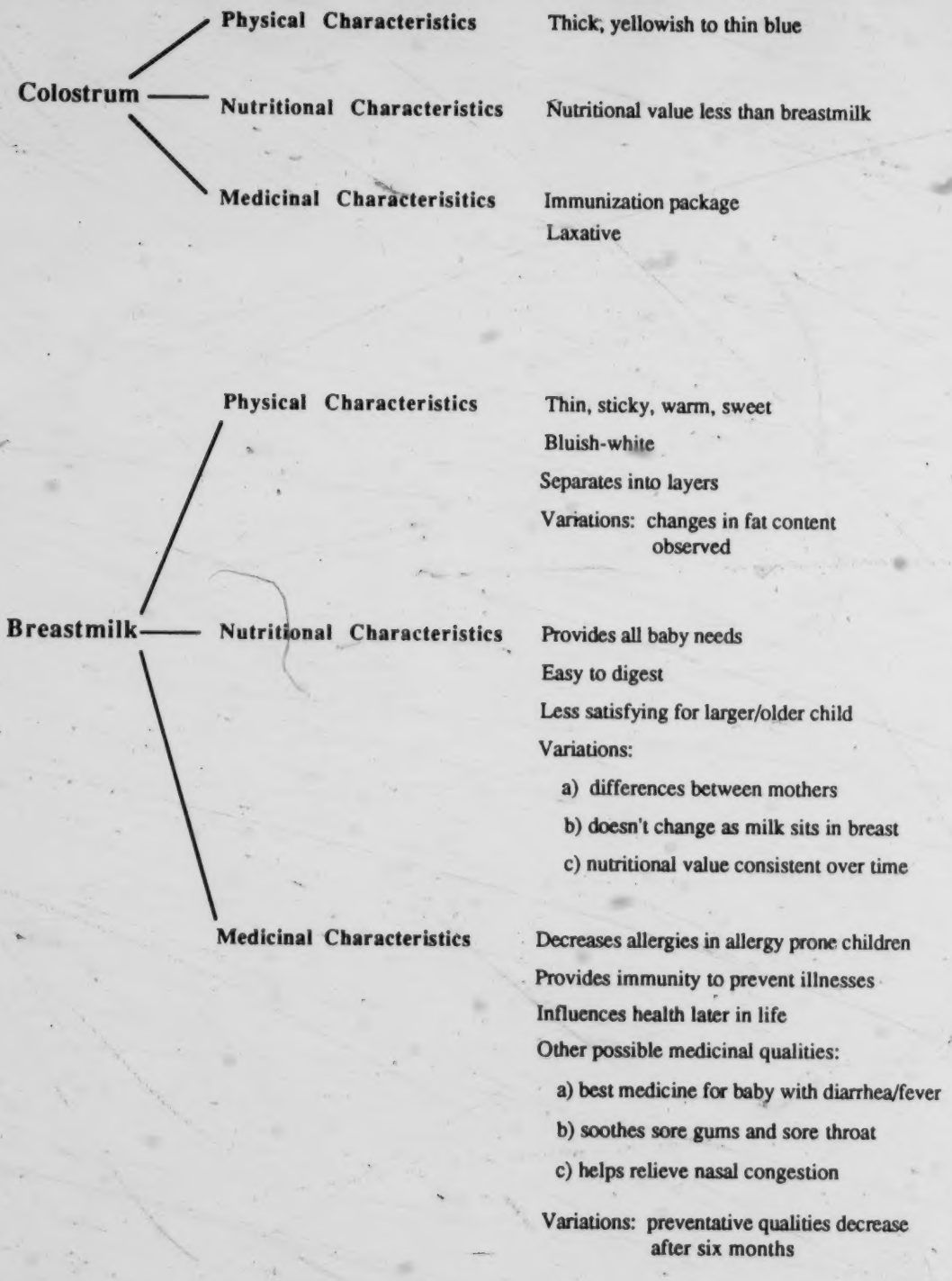

Figure 1. Descriptions of Colostrum and Breastmilk

colostrum led some mothers to believe it was the strongest milk. Knowing more about the colostrum was complicated by the fact there "wasn't much of it," that it was such a "short phase" and that you did not "feel it coming." A mother could be reassured that her baby was getting colostrum if they were voiding and having bowel movements and if they slept for two or three hours after a feeding.

Breastmilk

Physical characteristics. The "coming in" of the milk marked the commencement of establishing a supply of actual milk. When asked to describe breastmilk, mothers beganby relating some of the physical characteristics they had observed. Mothers' first observations of this new milk were that, in comparison to colostrum, it was a different consistency (i.e., thinner or thicker) and whiter in color. Most mothers agreed that the milk looked thin, felt sticky and warm and, for those who did taste it, sweet:

> I'd say its sort of like good farm milk with water in it to make it not quite so rich and just a mild sweetness, like maybe just a drop or two of honey—just a very mild sweetness, like [you can] just barely taste it, but you know it's there. [249, 4.1]

Mothers who observed only small drops of milk (e.g., on the baby's mouth) described it to be bluish-white, but "not quite as blue as skim milk" and not creamy. One mother explained that she just assumed the appearance remained consistent because "you never really look at it." Mothers who expressed milk described the milk in greater detail: "It's like there's the lighter fluid, then a kind of creamy fluid in amongst it. Like it's almost like farm milk before they separate it" [1151, 5.1]. When the milk sat for a while, layers of these constituents formed. While the more "solid" part of the milk was white and thick, the fluid was "thin like water" and had an "apple juice" or clear color. Some mothers also observed that a layer of fat formed on the top of the milk. Mothers who expressed milk also noticed changes in the appearance of the breastmilk. For example, one mother noticed changes which began after the first six weeks of breastfeeding:

> The first at least month, it was very, very fatty—more than that, even. I think it started gradually decreasing the fat—the rich creamy milk gradually from six weeks onward. But even now, I mean, he's eight months old and if I express milk, there's still the little bit of fat on top....I think it's just part of the plan, part of the way it is, because if it remained...very fatty for the entire time that you breastfed, the child would be pretty big....It goes with their growing needs. [149, 4.1]

Two other mothers noticed differences in the appearance of the milk when they expressed. For one mother, the milk looked "more clear", other days it was "cloudy". She was unsure whether the cloudiness meant more fat in the milk and thought it could be part of the "nutrition" of the milk itself. Another mother noticed that the longer she expressed the "more fat content" the milk had. Although she had heard that the appearance could change in this way, she was not sure why this would happen. A mother who had breastfed for several years without expressing had not observed changes in the appearance of the milk until she heard about this through her recent contacts with the La Leche League. She explains:

> I have a feeling that the first milk is very watery and that the back is creamier. [Have you noticed that ...?] Well I can't really tell, although, maybe, I suppose if a person was really paying attention the first milk would be sort of bluer and as the baby nurses it turns more yellow. I mean, I can sort of say that that is, you know by the time baby finishes her mouth is sort of all yellowy rather than just sort of clear....I didn't know that until this last year about this front and back milk. [222, 2.1]

Freezing breastmilk for future use also created changes in the appearance of the milk. One mother explained that when the milk thaws it almost looks and smells like it has soured. She states, "The odor is not pleasant . . . it looks like it has gone bad, like its curdled. You have to really shake it up, and it's completely changed from fresh [milk]" [233, 4.1]. After discussing these observations with an "experienced mom," she was assured that the milk was still good.

Nutritional qualities. In describing the nutritional qualities of breastmilk, most mothers were clearly convinced that breastmilk was the "most complete type of nutrition" for their babies. For some, the strength of this conviction was evident even before the baby was born. As one mother stated, "It never even occurred to me not to nurse...you just know

that you're doing something good for your baby" [451, 7.1]. There was a indubitable trust that their bodies were capable of producing the "perfect" kind of food for babies. It was what their breasts were meant for. One mother's words summarize the basis of this belief:

> God gave us something to feed our kids with, you know, I mean...what have people done through all the centuries? You know, our race has still survived, right? That's all they had was breastmilk, and they've nursed babies 'till they were five, six years old or more, and sometimes 'till they were ten and eleven 'cause that's all they had and it was nutritious. [1761, 6.1]

Later on, watching their infants grow healthy, strong and contented on the milk confirmed this belief. For one mother who had nursed her first child for two weeks and her second for three and a half months, some of this conviction was missing. She described the nutritional benefits of breastmilk as follows:

> ...just that pretty well it was better for the baby. But that's about it. Like I've heard from my aunt ...and doctors and then I've read a lot of stuff that always says—even actually on formula, like right on the cans, it says "breastmilk is better."...They [her babies] had everything that they needed there. I didn't have to worry about anything else. [1461, 8.1]

In describing other nutritional qualities of breastmilk, mothers referred more specifically to observations they had made of their infants. Albeit mothers heard that breastmilk was easy for their babies to digest, they believed this to be true because their infants demanded more frequent feedings than formula fed babies and their infants had fewer bowel movements. Still, this was a source of amazement for at least one mother:

> Mother's milk is so pure . . . it's so pure that's there's almost nothing, no by-product and it's all digested, so that's something that's been sort of intriguing for me. [164, 6.1]

However, not all mothers were reassured by this kind of reaction in their infants. For one primigravida whose baby began having bowel movements every week or ten days at six weeks of age, this became a great source of worry:

> I just thought maybe my milk was just not enough, not rich enough or I don't know ...The doctor said, "Well maybe it's just your milk. You don't have enough roughage to make him go."...But I heard that breastfeeding babies will sometimes do that....Maybe I just didn't have that thing he needed. [55, 3.1]

Mothers also discovered something about the way breastmilk was digested through giving their infants formula. One mother states:

> I'm putting her on formula, now just for one day. So far I've already noticed one effect that it has. It makes her urine a lot stronger....'Cause it's burning or it's making her red down there...[and] one thing that smells differently already, that's her bowel movements. I think there's more stuff in formula. [1422, 5.1]

One experienced breastfeeding mother believed that the breastmilk served two nutritional purposes: providing food and quenching thirst. She thought that the watery foremilk didn't have much food value but was important in quenching a baby's thirst. She knew from past experience that her babies did not need water or juice when they were nursing. The "back" milk she believed to be the "food part" of the milk. While other mothers thought that the milk could quench a baby's thirst, they often gave water or juice in a bottle if they thought their babies were thirsty. They believed the predominant function of the milk was to "satisfy an empty tummy." Most mothers, however, agreed that breastmilk was less satisfying for larger or older infants. While the child may continue to breastfeed, there came a time when they also needed other foods. Although mothers looked to their infants for indications of when this might be, there was a wide range of opinions on how long one could expect breastmilk to sustain a child. One mother wondered if breastmilk was all a baby really needed for the first six months and thought it preposterous that a mother might have a baby as old as nine months on just breastmilk alone. Others thought it was a very individual thing and that some babies might be satisfied on breastmilk for a long time. Sometimes it just depended on the day, as one mother who was nursing a fifteen month old baby explained:

> At her weight you wouldn't think that breastmilk would be satisfying enough if she's really hungry. Because on the days where she is hungry I'll nurse her and that's still not enough. She's got to eat, so she eats. But some days breastmilk is good enough and it doesn't matter what I give her she won't eat it. [1866, 2.1]

Observations of other breastfed babies also prompted mothers to consider if there could be differences in the nutritional value of mothers' milks. For example, one mother stated:

> It seems like some little babies just get so fat all of a sudden, you kind of think that their milk is a lot richer than others...like cows for instance, certain types are much more rich than others, so you know, I don't see why they shouldn't be in people, but I'm not sure that they are. [77, 7.2]

This mother had wondered if her own milk could have been "lean" because during the first few months of breastfeeding, her infant was "such a skinny little thing." However, after her child began to gain weight, she decided that there probably was not a problem with her milk.

At the time of weaning, it was not unusual for mothers to nurse as infrequently as once every one to three days. Most mothers agreed that during this time the body "preserved" or "sustained" milk that remained in the breast between feedings. They thought that "old" milk was milk that sat too long in the fridge. All milk that came directly from the breast was considered fresh and good. The fact that their infants accepted this milk readily supported this belief. Only one mother wondered about the "goodness" of her milk as she weaned her baby. At this time, she was nursing once every one to two days. She noticed that immediately after nursing her infant would have a "funny" bowel movement. Her mother, who had not breastfed, also questioned the nutritional quality of the milk, drawing a comparison to cows:

> ...she[her mother] says when cows don't feed their calves anymore, their milk goes bad and it gets infected...and she got me thinking you know. Thinking, geez it is kind of strange that it's bowel movement would be so funny...he still took it [the breastmilk] and he didn't throw up or anything, and didn't appear sick. This was just the only thing that would happen to him. So I thought, well, maybe it affects his stomach or something. [255, 3.2]

Mothers were asked if they thought the nutritional quality of milk produced during the first six months was any different to milk produced after the baby was a year old. Most mothers were unsure as to whether any change took place and wondered if they would be able to tell. Only one mother was confident that the milk remained nutritious. She had noticed that when her fifteen month old daughter had been sick and refused other foods she would continue to nurse. On a total diet of breastmilk for even a week or two, she didn't

seem to loose weight. However, this informant was quick to point out that "you have to really nurse . . . to make up for no food" [1903, 2.1].

Medicinal characteristics of the milk. All mothers agreed that the milk significantly influenced the health of their infants. Some mothers not only believed that breastmilk provides immunity to prevent illnesses that the infant might otherwise acquire and decreases the risk of allergies in allergy prone children but that breastmilk also influences health in later life. One mother said, "If you're going to give your baby that chemistry of that milk, totally for the first six months, it's got to be doing something to its internal organs or what ever to make it a healthier child later on" [1220, 5.1]. Some mothers felt so strongly about this that they believed that if anything happened in terms of the health of their child either now or later in life they would be free of guilt. As one mother indicated, by providing her infants with breastmilk, she have given her children "the best chance they can get at a healthy life" [2201, 6.1].

While mothers learned about the preventative benefits of breastmilk from health professionals or other mothers, observations of their own children's response to breastmilk confirmed it for them. When their babies were healthy, they directly related this to the breastmilk. Only two mothers questioned the immunity breastmilk was suppose to provide. Interestingly, for both, their concern was related to their babies getting colds. One mother stated:

> I thought that when they were breastfeeding they are suppose to be immune to these kinds of things but he wasn't. He got a cold when he was a month old, [it] lasted over a week. And he got one again when he was about two months old and I thought, what is this? Now, on top of him not having enough, it's [the breastmilk] not good enough. [817, 3.1]

Having been told that breastfeeding babies did not get colds, the second mother indicated that she did not believe this: "Like I figure you're going to catch a cold no matter what you're eating. But I think that it [the breastmilk] would help a little bit" [1402, 8.1].

One mother, who had breastfed three children until they were four years old, discovered other medicinal qualities of breastmilk. She found it to be the "best medicine"

for diarrhea and fever. While her children often refused to take antibiotics or other foods when they were sick, they continued to nurse. After a few days, they were fine again. The breastmilk gave them the nutrition and fluid they needed, and the breastfeeding comforted them. She also found the "warmth" of the milk seemed to soothe their sore throats and their sore gums when they were teething. Even when her children had colds and their noses were plugged, the milk seemed to help:

> It some how clears their nose. You see they can keep going even though the milk is gone . . . for breastmilk I mean they'll suck for hours and it just come in little trickles because they are nursing all the time. But it seems to help their passages. [695, 2.1]

Other mothers were not sure if breastmilk had these medicinal qualities or not. For most, their children were healthy during the time they were breastfed. One mother thought that milk of any kind was inappropriate for a baby with an upset stomach. She believed if a sick baby received any comfort from nursing it would be from the act of breastfeeding rather than from the milk itself.

Mothers were also asked if they thought whether the preventative qualities of breastmilk changed over the time women breastfed. Most mothers were uncertain about this. Only one mother, who had experience with tandem nursing, offered any comment. She thought that the milk she produced during the first six months postpartum had more antibodies in it than milk produced after that. She theorized that the reason her ten year old daughter had not experienced any communicable diseases, even though she had probably been in contact with infectious children at school, was because she got a "second chance" at the "new milk" that would immunize her against these childhood diseases. This child breastfed during her mother's next pregnancy and, after the baby was born, continued to nurse until she was four years old.

Areas of Contradiction in Mothers' Attitudes Toward Breastmilk

From mothers' explicit and implicit comments about breastmilk, three major areas of contradiction emerged. The three areas are as follows: (a) beneficial versus disagreeable

nutritional qualities of breastmilk, (b) convenient versus inconvenient aspects of using breastmilk and (c) "feeling good" versus feeling "tied down."

Beneficial versus disagreeable nutritional qualities of breastmilk. Although mothers were convinced that breastmilk was a nutritious infant food unmatched by anything else, this milk was also viewed as an inappropriate food for themselves or for others. Mothers who tasted breastmilk only took a lick of milk off the top of their fingers, and some were even embarrassed about that. Yet several mothers tasted formula without any hesitation. One mother explained it this way: "It's probably just a thing in my head. Like if somebody said we're having rabbit stew, you think, 'Ugh. Rabbit stew!'" [249, 4.1]. Another mother found she couldn't taste her own breastmilk at all. Her husband and older daughter were able to taste some expressed milk but she could not. She attributed her reluctance to the fact that breastmilk was a kind of body secretion. She explains:

> That's the weirdness of it, it's something coming out of my body that shouldn't go back in, sort of thing. That's kind of the way everything else in your body works, once it comes out you don't stick it back in....I think there is a feeling of offensiveness, you know, of this excrement sort of a thing. But honest to goodness, I mean, if your kids grow up healthy from it, then it's good, you know. So on the one hand it's good and I think it's great. On the other hand, you know, for myself to just drink a glass, I would feel strange about that. But that's not my opinion of the breastmilk, I think it's an opinion of something coming out of me going back into me sort of thing. [1521, 6.1]

Mothers who firmly believed in the nutritional value of breastmilk also found it difficult to throw out extra breastmilk—it was almost unthinkable. They saved any extra milk to mix with baby cereal or froze it for future use. Despite the fact that a few mothers had thought of adding extra breastmilk to their baking in order to make their food more nutritious, no one had actually done this. Only one mother had heard of someone doing this and applauded the effort as a "smart conservation of natural products." Most mothers had not even considered using breastmilk as a supplement for adult diets.

Although mothers knew that breastmilk was nutritious, the appearance of breastmilk seemed to contradict this belief. They described breastmilk as "thin" and likened it to "skim milk." As one mother said, "Looking at the breastmilk you think, it doesn't look

very nourishing. It doesn't look like it would keep him satisfied" [1295, 3.1]. It was astonishing to think that something that looks like water was enough to completely care for a child for at least six months. The appearance of breastmilk just didn't meet a mother's expectation of a rich wholesome food.

Although mothers also agreed that breastmilk was easy to digest and saw this as an important nutritional characteristic of breastmilk, several mothers described breastmilk as "not as filling as formula." While some mothers believed that this was true, they also believed that it did not reflect negatively on the nutritional quality of breastmilk. One mother analogized breastmilk to fruit. Both were nutritious foods that were quickly digested. However, some mothers still hoped or expected their infants to keep to feeding schedules more characteristic of formula fed babies and sleep through the night, expectations that seemed incongruent with their beliefs about the nutritional characteristics of breastmilk.

Convenient versus inconvenient attributes of breastmilk. Mothers frequently talked of the convenience of using breastmilk as an infant food. Day or night, the milk was readily available, as clean as it needed to be and at the perfect temperature. Packing bottles and preparing formula was not necessary. However, there was an inconvenient side to using breastmilk that mothers also recognized. One mother's remarks summarize most mothers' feelings about this. She said, "It's kind of a two-way thing, it's inconvenient to have to nurse every three or four hours, but during the night and other times, it's a lot easier than jumping up and getting a bottle ready" [289, 7.2]. Keeping up with the frequency of feedings was exhausting for some. At times one could do nothing else but nurse. Going out also was not easy. While there were no bottles to worry about when "going out" with the baby, mothers often had difficulty finding suitable places to nurse comfortably in public. In addition, mothers had to contend with the discomfort of engorgement, sore nipples and leaking milk. Using breastmilk as an infant food was convenient for a mother and yet it was not.

"Feeling good" versus feeling "tied down." For mothers, the breastmilk brought both positive and negative feelings. Mothers experienced a deep sense of gratification from watching their infants grow healthy and strong on the milk they produced and realizing that their infants came to recognize them as the sole person who provided this milk. However, along with this growing attachment between mother and infant came a feeling of being "tied down." Mothers knew that in order to establish a good supply of breastmilk they needed to be close to their infants and nurse on demand. Expressing milk could provide some freedom from the infant but not from producing milk. When breasts are engorged, there is no escape from expressing or nursing an infant. As long as a mother was breastfeeding, the production of milk never ceased. Mothers also felt "tied" to watching their diets, getting enough rest and refraining from medications, dieting and alcohol.

Reasons for Breastfeeding

On the basis of card sorts and comments about breastmilk, informants thought that certain beliefs and attitudes related to breastmilk could influence decisions to breastfeed and motivate mothers to continue breastfeeding. For mothers who consciously made a decision to breastfeed, it was thought that knowing that breastmilk was "made for babies" and gave them with the best start possible provided the main incentive to nurse. Characteristics of the milk that provided a basis for this belief included that the milk was wholesome, easy to digest, provided immunity from illness, and decreased allergies.

Factors that were thought to motivate mothers to continue to breastfeed generally related to the benefits informants believed providing breastmilk had for both mother and baby. One mother, however, was quick to point out that the first three months of breastfeeding were difficult and often not enjoyable. Once the milk supply becomes well established and a mother's concern about her milk decreases, the benefits of breastfeeding then become more apparent. For example, she stated:

> ...the closeness, it continues to actually grow more, it becomes more important to baby and mother as time goes on. And that's why mothers that have only nursed, say three months or six weeks, they really—they've really lost out on a lot. [812, 2.3]

Other benefits mentioned as being important included that the milk helped ensured that the baby was healthy and provided what was necessary for a good start in life, the milk was consistent and that feeding a baby breastmilk was convenient to the mother.

Managing the Milk

Mothers' Influence over the Quality and Quantity of Milk Production

Mothers' perceptions of their influence on the quality and quantity of milk varied considerably among the nine informants. A typology was used to illustrate the divergence in perspectives and is shown in Figure 2. Few informants could be said to clearly reflect any one of the perspectives at all times. However, general trends in the data showed that particular informants seemed to hold beliefs that conformed to one perspective more than others.

Through the talk of some mothers, it became apparent that they believed that the quantity of milk production was determined by the baby's demand and what the body was capable of producing and that one's body also determined the quality of the milk produced (cell a). These beliefs were based on a trust that one's body would produce good milk and that a baby would demand the amount of milk he or she required. One mother's comment summarized this perspective, "It's just gonna happen, it's like blood flowing through your veins...it's a physiological function that you don't have a—like smooth muscle action or something, you don't have any [control over]...It's been taken care of for you" [1043, 1.3]. Stories told by other women of milk not being "strong enough" were not believed.

For those sharing this view, there was agreement that keeping your body healthy while you were producing milk was important; however, reasons for doing this differed. One mother believed that "abusing" your body would "hurt breastmilk" [1734, 6.1]. Another believed that the breastmilk was always what it needed to be and that if a mother did not

Influence over Quantity of Production	Influence over Quality of Production: Infant	Influence over Quality of Production: Mother
Infant	Quantity is determined by infant's demand and what the body is capable of producing. Body produces the kind of milk an infant needs. Quality cannot be influenced directly by mother. **a**	Quantity is determined by infant's demand and what the body is capable of producing. Mother can directly influence quality. **b**
Mother	**c** Quantity can be directly influenced by mother and infant. Body makes "good" breastmilk. Quality cannot be directly influenced by mother.	**d** Mother can directly influence both quality and quantity. (Infant plays a minor role in influencing quantity.)

Figure 2. Mothers' perceived influence over the quality and qantity of milk production

keep herself healthy she would be the one to suffer rather than the milk. She explains:

> Producing milk is a lot like when you're pregnant. The baby takes what it needs and leaves you depleted. And the same with making milk. I think the milk takes what it needs and if you're not supplementing yourself then you're the one that's gonna really suffer, more that the milk. [1170, 2.3]

Therefore, when mothers held these beliefs, they considered that they were only responsible for keeping their bodies healthy and providing the opportunity for their babies to nurse when feedings were demanded. They tried to keep their bodies healthy by taking vitamins, eating a balanced diet and avoiding harmful substances, such as alcohol and drugs.

Attempts to influence the quality of milk confirmed the beliefs associated with this perspective. For example, a mother whose baby had infrequent bowel movements tried to put more "roughage" in her breastmilk by eating bran. She also avoided cheese and drank orange juice. Despite these attempts to change the quality of the milk she noticed that none of these things made a difference to the pattern or consistency of her baby's bowel movements. She believed that her milk was "not good enough," concluded that there was nothing she could do about it and decided to introduce formula. This was the only alternative open to her to ensure the health of her infant. Another mother noticed that that food she ate had no undesirable effect on the milk. No matter what she ate, her babies did not react any differently. She thought that the talk about cabbage, onions and spicy foods affecting the quality of the milk were just "old wives' tales."

Perceptions of a lack of direct control over milk production were also reflected in the thought there might be an upper limit to the amount of milk a mother could produce. When a baby needed more than the milk available, other foods would need to be introduced. For example, one mother thought her body could not keep up with the demands of her five month old infant: "He could've put me in the ground on just breastmilk alone. You could tell that he was not—it was not enough for him" [942, 3.2]. As changing the quality and quantity of milk produced was viewed as something out of a mother's control, mothers in this group did not feel guilty about introducing formula.

The following case study illustrates this perceptive related to one's influence over the quality and quantity of breastmilk.

Case Study I

Sandra, a 27 year old mother breastfeeding her first baby, "always" thought she was "low" on milk, although she believed that she had enough that he "wasn't starving." She concluded that some women just have more milk than others. During the six months that she breastfed, she noticed that it was her baby's increased demand during growth spurts that "built up" her milk. It did not seem to make a difference if she ate more or drank

more. Her body seemed to respond more to the increased sucking than anything she could do. Sandra was also concerned about the quality of her breastmilk. For example, she thought that her milk was not providing enough roughage for her baby as his bowel movements were widely spaced. After changing her diet to include less cheese, and more bran and fruit, she concluded that the quality of her breastmilk could not be altered in this way.

Sandra's baby grew rapidly in the first three to four months, and she became increasingly concerned about her ability to "keep up" with what she thought that her baby needed. Knowing that she could not alter the quality or quantity of her breastmilk, she began to supplement with formula. While she did not like the "impersonal" nature of bottle feeding, she accepted that giving formula was the only option available to her to ensure that her infant's nutritional needs were met. Breastfeeding was gradually replaced by formula over the period of two months, and by six months, the baby was weaned completely.

The second way perceptions related to control over the quality and quantity of breastmilk are presented in cell b. The main feature of this view was that despite the belief that the quantity of breastmilk produced by the body was largely beyond one's control, there was an unequivocal belief that a mother could influence the quality of the milk produced. The potential to produce "good milk" was thought to be shared by all mothers, but it did not mean that all mothers produced good milk. Mothers who shared this perspective believed that what a mother "put in to her body" was what you "got out." These mothers, therefore, focussed their attention on ensuring that the milk was "good enough." They believed that some mothers' milk was not as nutritious as others and attributed this solely to the things that a mother was doing. The following case study is a typical example of the experience of mothers who held these beliefs.

Case Study II

Helen is a 28 year old mother who had breastfed three children. When she was breastfeeding, she did not worry about whether she had enough milk. Confident in the

principle of "supply equals demand," she simply nursed her babies as much as they desired, and there always seemed to be enough milk. However, Helen was convinced that the quality of breastmilk depended on what a mother ate. Firmly believing this, she only ate "good foods" to "put nutrition" in the milk she produced. A visual reminder of a balanced diet on her refrigerator door helped her evaluate her diet each day. If she thought that she had not eaten enough food during the day, she tried to make up for it by eating extra food even though she might not be hungry. To Helen "abusing your body" with alcohol, drugs and "bad eating" would directly harm the quality of the milk produced. She believed that consuming junk food would decrease your appetite for good food and, therefore, reduce the quality of the milk in an indirect way.

Helen nursed to provide her children with what she thought was the best possible start she could given them in life. Although she felt exhausted while she was nursing, she continued to do so for the health of her children. To Helen, it was a "sacrifice" to breastfeed. Yet breastfeeding provided the promise of freedom from guilt related to the present or future health of her children. Helen's last baby was exclusively breastfed until six months. The decision to wean was made by Helen when problems with recurring blocked ducts made it too painful to continue breastfeeding.

Mothers whose beliefs reflected a third perspective (cell c) perceived that their responsibility in producing milk lay primarily with ensuring the quantity of milk production. While they recognized that the infant also played a role in determining whether there was enough milk, the major responsibility for this lay with the mother. Not having enough milk was a fallacy in these mothers' eyes. Mothers who experienced this problem were seen as not doing what they could be to maintain a good supply of milk. There was a sense that they were not trying hard enough. They believed that the body's potential to produce milk was almost unlimited. On the other hand, making good milk was not something these mothers who shared this perspective needed to be concerned about. As one mother stated:

> I always think that the milk you produce is always good milk. It's just whether the quantity is there or not....I don't think there's such a thing as bad milk. I think if you can't produce good milk, you don't produce milk at all. I don't think you can make it better. [874, 7.2]

These mothers did, however, believe that a mother could contaminate her milk by taking drugs or eating toxic substances. Yet, they did not perceive that the nutritional quality of the milk was affected by these substances. Comments that substances, such as alcohol and medications, "passed through" the milk left the suggestion that the milk was left untouched. The next case study depicts these perceptions as they are reflected in one mother's experience.

Case Study III

Judy is a 35 year old mother who has recently finished nursing her first child. She firmly believed that her body would always produce "good milk" and that it was not possible to make it any better. Although she maintained a balanced diet, she did this more to ensure a good supply of milk than to influence the quality of her milk. She did notice that some breastfed babies grew fat more quickly than others and concluded that some mothers might produce breastmilk that has a higher fat content than other mothers. However, she believed breastmilk with less fat content was not "bad milk." Judy assumed that the body made the milk the best it could and that the milk remained, therefore, relatively consistent throughout the duration of breastfeeding.

Although Judy was confident about the quality of her breastmilk, she was concerned about whether she had enough milk. She consciously used several strategies to ensure the quantity of her milk. She ate more to keep up with the energy requirement to produce more milk and increased her fluid intake. As she was a full-time student during the time she was breastfeeding, Judy arranged to nurse her infant at lunch time and encouraged the baby to nurse frequently when she was home "just to make sure" that she would not lose her supply. If necessary during day-time absences, the baby was given formula. Judy's strategies seemed to work well for her. She was able to maintain her supply and continue

nursing until her baby was nine and a half months old. The decision to wean was made by Judy, prompted by the observation that her baby was starting to "play" at the breast.

The final perspective (cell d) represents the view that mothers can and do play a major role in influencing both the quality and the quantity of breastmilk. The infant is thought to play only a very minor role in influencing the amount of milk. Mothers who held this view were, therefore, concerned with monitoring both the quality and quantity of their milk. It was a role they took seriously, and they worked very hard to ensure the success of their breastfeeding experience. When there were either problems with the supply or the quality of milk, these mothers felt responsible. For example, it was not uncommon for mothers to feel guilty about eating foods they believed caused their babies' gas. An example of one mother whose beliefs reflected this perspective is presented in the following case study.

Case Study IV

Alice was breastfeeding her second child when she joined the study. She is 34 years old and was somewhat surprised to find herself still nursing a seven month old baby. However, the "convenience" of breastfeeding made it so easy to continue that time slipped by unnoticed.

Alice continually "watched her diet" while she was breastfeeding as she believed that the nutrients from food consumed "passed through" to the breastmilk. For example, if she felt she had not eaten as well as she might have during the day she sometimes used cream instead of milk just as added reassurance or to "catch-up." Alice was also concerned about her supply of milk. She recognized that the infant's demand would determine the amount of milk that would be produced. Yet, in addition, she believed that it was very important to increase her fluid intake while she was nursing to ensure an adequate supply.

Using these strategies to ensure the quality and quantity of her milk Alice found that she was able to continue nursing even when she went back to work part-time. On the days she worked, Alice nursed in the mornings before she left and then on demand during the evening and night. On days spent at home she reverted back to nursing "full-time." This

pattern of nursing worked well for Alice, and she continued to breastfeed until her baby was eleven months old. While she was waiting for the baby to imitate weaning, a problem with thrush led to her make the decision to stop breastfeeding.

Ways to Influence the Quantity of Breastmilk

Mothers who believed that the quantity of milk could be influenced by either the baby or themselves presented a wide range of factors they considered would either increase or decrease the supply of milk. These factors are presented in Figure 3.

The Baby's Influence on Milk Supply.

When mothers talked of supply, the first thing they often mentioned was that "supply equals demand." It was a principle of breastfeeding that they were all familiar with. As one mother said, "The more you let your baby suck, the more milk that is produced. That's all there is to it....It [breastmilk] will always come" [156, 2.2]. For some mothers, this belief relieved any worry they might have about their milk supply. As one mother explains, this, in turn, brought a secondary benefit : "It's probably the lack of worry that helped 'cause I know anxiety can really cut your milk supply off" [352, 6.1].

There was less agreement on how this principle of supply and demand worked. Some mothers found they had to wait up to three or four days for the extra milk to come in, others thought it took 24 hours, and another believed that increased suckling augmented the supply a little bit each time the baby nursed. Mothers did agree that putting a baby on a schedule or nursing less often would decrease the supply.

Some mothers recognized that a baby that wanted to nurse and who had little difficulty latching on or sucking was extremely helpful in establishing and maintaining a good milk supply. Yet, there was some uncertainty as to whether the strength of the baby's suck influenced supply or not. Several mothers thought that a baby with a light suck would just need to nurse longer than a baby with an aggressive suck. Others thought that an aggressive suck could make a difference. One mother's personal experience seemed to confirm this. Her first baby was a "light" sucker. At the time, she thought that he had

		Factors which Increase Quantity	Factors which Decrease Quantity
AMOUNT PRODUCED:			
Influence of Baby		Helpful baby Aggressive Sucker	Poor nurser Light sucker
		Increased frequency of nursing	Decreased frequency of nursing Putting baby on a schedule
	Emotional Factors	Be calm, relaxed Mother's positive attitude	Anxiety Being up-tight, nervous Mother's negative attitude
Influence of Mother	Dietary Factors	Increased fluids Eat extra food/good food Beer Raspberry & fennel teas	Trying to diet
	Others	Breast Expression Rest	Giving a supplementary bottle Being tired Pregnancy
AMOUNT RELEASED:			
	Letdown	Thoughts of baby/milk letting down Baby's cry Being calm, relaxed Warm compresses or bath	Being upset or tense Anxiety Being tired

Figure 3. Factors that affect the quantity of breastmilk

enough milk. Now with her second baby, she feels that she has a lot more milk and notices that this baby sucks much more aggressively than the first. For another mother, the effectiveness of a baby's suck on supply was clearly demonstrated when comparisons were drawn to breast expression. She stated:

> ...expressing alone won't keep up your supply. It diminishes with each [time]...because the baby's sucking is quite different. They take even more than what you've got. And they'll keep sucking when you're empty and that in itself builds up the milk. [231, 2.2]

It is interesting to note that two mothers who were absent from their babies for part of the day made a point of encouraging their infants to nurse frequently, "just to make sure" they did not lose their milk supply.

Mother's Influence on Quantity of Breastmilk

Emotional factors. Mothers agreed that being "uptight," anxious or nervous would decrease the milk supply. Emotions, such as being happy or sad, were seen as having no effect. Some mothers thought stress influenced milk production, and while other informants agreed that this might be true for some mothers, they did not find this to be the case in their own experience of nursing. Mothers with first babies were thought to be more likely to experience these problems. One mother who successfully breastfed her babies while both she and her husband were attending graduate school believed that as long as you were relaxed while you were nursing that was all that mattered:

> We've been under a lot of stress, but I haven't had any problems nursing....There wasn't time for relaxation, so we were uptight but I always had a good milk supply 'cause I ate well and I tried to relax at the time I was nursing. [1590, 6.2]

One mother reasoned that small problems that you "worked out" did not influence the milk but if you were "uptight" for a long period of time this could cause you to have "not enough milk" [1497, 4.2].

Few mothers believed that emotional factors could effect the milk supply directly. For example, one mother theorized on the basis of her own experience that being uptight probably had more indirect influence on the supply. She states:

> I don't know what's—you know, the chicken and the egg thing. Did being uptight reduce the milk supply so the baby nursed less? Or was the mother nervous and uptight and the baby didn't want to nurse as much and therefore the mother's milk started to decrease....I know when I'm uptight and I go to take my babies to nurse, and if my arms are tense, my baby can't nurse....I have to really force myself to really relax and be calm so that I'm not clutching my baby...so that they can relax and eat, you know....I think just that tension goes through the baby—you can just feel it. [1629, 6.2]

Another mother suspected that an anxious, nervous or uptight mother might not be quite so willing to sit down and take the time to nurse. Despite these differences, all mothers agreed that being calm and relaxed was an important part of ensuring a good supply of breastmilk. Not only would the effects of being uptight be avoided but a mother would then be able to nurse her baby as much as was needed.

In addition, some mothers believed that a mother's attitude also affected the amount of milk produced in an indirect way. Without a positive attitude, mothers were more likely to be anxious about their supply, unwilling to make the commitment to breastfeeding that was required to ensure a good supply of milk and gave up more easily. One mother believed that a negative attitude could affect the baby's desire to nurse as well as the milk supply. She states:

> If a mother doesn't want to nurse her baby, I think psychologically it affects her milk—it must. [In terms of making it less?] Yeah. And also in terms of whether baby wants to nurse or not. I understand that babies know whether their mother wants to nurse them or not. [2385, 2.2]

On the other hand, if a mother really wanted to nurse, she could encourage even a reluctant baby to nurse. In addition to a genuine desire to nurse, confidence in one's ability to produce sufficient milk was also viewed as an important factor in ensuring that the milk was there. The influence of family members who had breastfed, previous personal successful breastfeeding experiences and a supportive husband were seen as factors which could positively influence this confidence. While some mothers believed that "convincing yourself" that there would be enough milk could make a difference to the supply, others were more skeptical.

Dietary factors. All mothers agreed that having "lots" to drink was a significant factor in increasing the supply of milk. Several mothers found that they did not have to think about doing this because they found that their thirst increased dramatically while they were lactating. It was something they could not ignore. Other mothers consciously increased the amount of fluids they drank "just to make sure" they were making enough milk and drank even more if they felt their supply was down. The underlying assumption was that the fluid to produce milk had to come from somewhere, so by increasing one's fluid intake, more milk could be produced. While some mothers assumed that the type of fluid consumed was incidental, others were specific about the kinds of fluids that they believed were effective in increasing milk production. Beer (especially stout) and wine, in moderate quantities, were viewed as effective because they had the additional effect of enhancing relaxation. Milk, raspberry tea and fennel tea were also mentioned. One mother believed that soft drinks would reduce the supply of milk.

Eating extra food and "good food" were viewed by many mothers as contributing to the amount of milk produced. Mothers' experiences seemed to verify this. One mother said, "I would have to eat more, it seems, to keep up with him because I was always hungry. It seems that he was taking as much as I was eating" [769, 3.2]. For another, the experience was similar: "I know I eat extra food, like sometimes it seems like I've got a bottomless pit....It's because I'm producing milk for my baby" [1813, 4.2]. Weight reduction diets were perceived as having a negative effect on milk supply. For most mothers, being on a diet meant that your body did not have what was required to make enough milk. However, for one mother, the effect was more than that. She explained:

> If I'm on a diet I'm miserable...and if you're not happy and if you're not calm and if you're uptight...[that's] going to affect your milk let-down, and probably this would all affect the quantity of milk too. [558, 3.2]

Other factors. All mothers agreed that expressing milk while you were nursing would help increase the supply of milk. However, for mothers who did express, they knew that breast expression by itself was not enough to maintain the supply of milk over an extended

period of time. Getting sufficient rest was also viewed as an important factor by most mothers. The converse, being tired, negatively influenced supply. For one mother, personal experience suggested this: when her energy level was low she noticed a decreased milk supply.

One mother knew that being pregnant decreased her milk supply. The toddler who was nursing at the time was quick to point this out to her.

All mothers agreed that giving a supplementary bottle would decrease the demand for milk and, unless the breasts were also expressed, the supply. Only one mother emphasized the need to express at the time that the missed feeding would normally take place in order to maintain the supply. There was a wider range of opinion on the overall consequences of giving the baby a bottle. One mother believed that babies could lose interest in nursing if a bottle was introduced. However, other mothers in the study successfully combined formula feeding and breastfeeding from the time their infants were born and were still able to maintain a milk supply sufficient to meet the demands of their infants when they were home with them. Neither expressed their breasts, and both nursed their infants for over eight months.

All mothers had heard that the let-down reflex was important in ensuring a "nice flow" of milk when their infants were nursing. However, not all mothers felt the let-down reflex. Mothers suggested that this was because the reflex was "stronger" for some mothers than for others. One mother believed the strength of the let-down reflex decreased after the first six months. Mothers who could feel the let-down reflex were able to identify factors that could inhibit or enhance the flow of milk and, therefore, the supply available to the baby. They observed their milk to "come down" easily on hearing their baby cry or in response to thinking about their baby. Mothers who usually felt the let-down reflex noticed changes in the the flow of milk which seemed to be related to how they felt as well as their infants' behavior. For example, sometimes the reflex appeared slow when a mother was upset or tired and when an infant was impatient for the flow of milk. Anxiety,

tension and nervousness were thought to "get in the way" of the let-down. One mother explains how she tried to facilitate the flow of milk:

> [Sometimes] he's so hungry and he's so mad that he just doesn't want to do anything. And I actually sit here and go, "let down milk, let down milk." And actually say it, you know, do it, do it, do it. And I can feel when it comes down but I have to really concentrate on it, you know because I get so upset because he's upset and I don't know what to do with him. He just gets frantic and I try to calm myself down...'cause he starts to suck there's nothing there and he gets really mad. It has to be right there....if I'm really really tired you know, it will probably take longer to come down. [1163, 3.1]

This mother was surprised to find that the let-down responded to her thought patterns with her second baby and not with her first. This happened despite the fact that she felt she was calmer and more rested with her first baby. Other suggestions for mothers who were having "trouble" with their let-down reflex included relaxing before starting to nurse, use of warm compresses or warm baths and having a small drink of beer or alcohol. One mother thought there was nothing that could be done to enhance the flow of milk.

For mothers who could not feel the let-down reflex, it was thought that they should be able to tell whether the milk was flowing by noticing the fullness of their breasts and observing the baby. If a baby was "fussy at the breast," this could mean that the milk was not flowing as it should be.

Is There is Enough Milk?

Although most mothers were concerned about whether their infants were "getting enough" milk, this became their major worry and one of the "biggest areas of guilt" for mothers who believed they had some control over the amount of milk that was produced. Wondering if there was enough milk was something that was continually on their minds "no matter what" [607, 5.1]. As there was no way to measure exactly how much milk their babies were getting, mothers found other ways to monitor their milk supply. Most mothers did not use one cue, e.g., breast fullness, to establish that their milk was "low" or "building up." More often, it was a pattern of cues that led them to their conclusions. At

times, they had difficulty describing the physical sensations they experienced with changes in their milk supply or the subtle behavior changes they observed in their infants.

Mothers who had to "check" to ensure there was milk by expressing were viewed as being either inexperienced or "uptight." Yet for some mothers, it was reassuring. As one mother said, "that's really the definitive thing...to see if there is something actually there" [1218, 1.2]. By watching and listening to see if the baby was swallowing and by checking the baby's temples, mothers learned to tell if the baby was getting milk at any particular feeding. To reassure themselves that there was enough milk, they looked to their babies. Judgements were based on the number of wet diapers, weight gain, growth and the contentedness of their babies.

Some mothers also thought that the time between feedings was an important indicator of the amount of milk they had. For example, one mother noticed that her baby wanted to nurse more frequently in the evening and, with the support of other indicators, attributed this to having less milk at the end of the day. All mothers knew that frequent demand for feedings could mean an infant was going through a growth spurt and reflected a need for more milk. However, there was concern, expressed by a few mothers that the milk was not there when the baby needed it. One mother commented she did not have time between frequent feedings to fully replenish her supply of milk so the baby was unlikely to get the amount of milk he needed or wanted. Another believed that there really was not enough milk during a growth spurt and that a mother and baby would just have to wait for the milk to build up. Mothers who felt badly about putting a baby to nurse on an "empty" breast when they believed their infants were hungry thought it may be necessary for a mother to use formula at these times. Others did not seem concerned about whether increasingly frequent demands for nursing were related to a growth spurt, a decreased supply or simply a need for nurturing. They believed it was only important to respond to these demands by nursing.

Some mothers also knew whether there was milk in their breasts or not by whether or not their breasts were spraying or leaking milk and how their breasts felt. If breasts felt full, heavy or sore, it was a sure indication that milk was being produced in large quantities. When their breasts "felt empty," mothers knew they did not have any milk left. Mothers also used the feeling associated with the let-down reflex and the feel of a baby's suck as indicators. For example, after breastfeeding four months, one new mother thought she could "feel" that her baby got most of his milk in the first five minutes of nursing. She explained:

> Well, when he starts you can really feel the milk...the let-down. You can feel that there is a lot of milk coming in and also you can hear him like, "Gulp, gulp, gulp." And then after awhile I can feel my nipples starting to get sore and it's kind of like he's, I don't know, sucking on empty. I can feel him sucking harder as if like he's trying to suck hard to draw more out. At the beginning he hardly has to suck at all. [1321, 3.1]

Energy level and mood changes were important indicators for one mother. When she felt exhausted and her mood was low, her breasts did not feel as full as when she felt more rested. One mother also recognized that feelings related to the milk changed over the duration of breastfeeding her infant and also had to be taken into consideration in order to determine if there was enough milk:

> Like my milk is different now than it was when the baby was newborn. I think it all basically just has to do with the way it is produced....At the beginning there's this urgency, and your body is just a-making milk. Now it's not urgent. And your body is sort of settled back down, sort of lazy...it just feels different....You know the mechanics of it are different now. Because it doesn't just come squishing down—you know, it doesn't come and then it all sits right here any more. Like you have a let-down, but it's nothing like it was the first, say, three to six months. [976, 1736, 2.2]

Without any visual indicators of the amount of milk being produced, mothers had to learn indirect ways of judging the amount of milk and gain confidence in using them. Becoming more aware of their physical experience of lactation and breastfeeding and learning to recognize significant infant behaviors were important parts of this process. When they were successful in doing this, mothers were very sure about whether there was enough milk or not.

Ways to Influence the Quality of Breastmilk

Mothers talked of the quality of milk being influenced by things that "passed through" the milk, as well as by things that "affected" the milk. There was, however, variation in the way these terms were used. Several mothers talked of such substances as medications, alcohol and caffeine passing through the milk . This idea is reflected in this mother's statement: "I wouldn't say it [medications] does anything to the milk itself . . . but it would upset the baby through the milk, 'cause it would go through the milk" [662, 8.2]. For these mothers, the "goodness" of the milk was not influenced by these factors, although there could be "detrimental" influences on the baby. Others disagreed with this view saying such things as alcohol and medications did influence the quality of the milk and, therefore, "affected" it. For at least one mother, the milk became "contaminated" by the presence of these substances. Foods that were digested by the body were commonly viewed as "affecting" the breastmilk. One mother gave the example of garlic, suggesting that the consumption of garlic would "affect" the milk by giving it a garlic flavor. However, some mothers believed that, just like medications and alcohol, the nutrients from good food did "pass through" the milk . Others used the words interchangeably in talking about factors that influenced the quality of milk. The factors mothers believed to affect the quality of breastmilk are presented in Figure 4.

One basic premise underlies the beliefs of mothers who considered that they had some influence over the quality of their milk. These beliefs were based on the principle "you are what you eat." A mother explained: "If you are what you eat and you're nurturing the baby, then it kind of stands to reason that the breastmilk is what you eat, too" [1156, 4.2]. One mother felt strongly about this. She believed that mothers who did not eat right and drank coffee or alcohol should have their babies on formula because it would be better for them that the breastmilk they would produce [1700, 5.1]. Although mothers could not directly evaluate the content of breastmilk, breastfeeding experiences seemed to confirm these beliefs. For example, one mother noticed that drinking a cup of coffee in the

morning made her daughter "hyper." She reasoned that if coffee went through the milk then a "certain percentage" of other things consumed must also go through.

It is not surprising, then, that mothers who were concerned about the quality of their milk "watched" their diets. They believed that without a balanced diet of wholesome food the nutritional value of their breastmilk would be reduced or it "would be lacking something." Good food was thought to add nutrition to the milk that was produced. In a similar vein, junk foods were viewed as having very little nutritional value and, therefore, contributing nothing to the "content" of the breastmilk. One mother believed that "high

Factors Which Positively Influence Quality	Factors Which Negatively Influence Quality
Balanced diet, good food	Trying to Diet
Eating Extra Food/Milk	Junk Foods
	High Sugar Foods
	High Allergen Foods
	Gassy Foods
	Caffeine
Beer (in small amounts)	Liquor
Vitamins	Medications
Calcium - tablets, milk or calcuim rich foods	Birth Control Pills
	Nicotine
	Environmental Toxins

Figure 4. Factors affecting the quality of breastmilk

sugar foods" would pass through the milk and have the effect of making the baby "hyper" [763, 8.2]. However, another mother thought that junk foods would decrease a mother's appetite for good foods, depleting the quality of the breastmilk in an indirect way. She wondered if junk food could really effect the milk directly:

> I don't know how much it would, in terms of its own effect, put lots of negative stuff in the content, in terms of adding tons and tons of fat or something—I don't think your body would let all that fat go through. Like if I pigged out on potato chips day in and day out or whatever, I don't think that all that cholesterol and stuff is going through to my baby. I mean, I think it—the body balances the amount, the types of nutrition that goes into the milk. [848, 6.2]

While some mothers found that their hunger while they were nursing was a sufficient reminder to eat, they felt a need to be conscientious about what they were eating. As a visual reminder one mother attached a pictorial guideline representing a balanced diet for pregnant and lactating mothers to her refrigerator. She said, "I'd make sure that I had so many servings of all these things and I'd force myself to eat them even if I wasn't hungry" [504, 6.1]. Others, who felt their "normal" diet was already adequate, simply drank more milk or added extra nutritious foods like yogurt, cheese and fruit. The concern about eating enough is reflected in this mother's words:

> If I'm down a bit that day then I try to catch up for the next day. And if I have cereal I probably have cereal cream rather than milk....I think, "Oh well, there, it's slightly fattier. More fat in it, more calories. Maybe that's good for him." So I'll use the cereal cream instead of skim milk, which is what I would normally be drinking. [846, 1.1]

One person thought that drinking beer (in small amounts) added vitamin B to the milk. Reduction diets were viewed as inappropriate for producing good milk as they added an insufficient amount of nutrients to the milk.

Some mothers took vitamins as added insurance that they would be producing good milk. However, not all mothers were convinced this was necessary. Some mothers who had taken vitamins while breastfeeding their first babies and not with their second or third infants did not notice any difference. They concluded that a balanced diet probably provided all the vitamins that were necessary. One mother did not take vitamins because

she was concerned that excess vitamins would be excreted in the breastmilk, causing her child to be dependent on higher levels of vitamins than normally necessary.

Mothers ensured they had enough calcium in their breastmilk by taking calcium tablets, drinking milk and/or eating other calcium rich foods. Several mothers firmly believed that milk was not essential for providing calcium in the milk or producing good milk. One mother, who did not like milk, ate foods she believed were high in calcium.

Most mothers were not only concerned about the nutritional quality of the milk but also about other affects that the milk had on their infants. They felt responsible for watching for their infants' reactions, trying to determine the food that could have produced this effect in the milk and eliminating it from their diet. If their babies were upset, mothers often blamed themselves. It was thought that eating excessive amounts of any particular food, especially "gassy foods," could "bother" a baby through the breastmilk. Foods that were classified as "gassy" included coconut, broccoli, brussel sprouts, cabbage, beans, garlic, onions, cauliflower and green peppers. Some mothers were sure that anything that gave them gas would also give the baby gas. Spicy hot foods were also thought to adversely effect the baby. Chocolate and drinks, such as Selzers and eggnog, were found to upset some infants.

It was not always easy to make the connection between the things that a mother ate and an unusual reaction in her infant. Not all babies would react to the same foods. Finding out which foods affected their own baby was a matter of "trial and error." Mothers knew that it would be normal for their babies to have some gas and recognized that their digestive systems were immature during the first few weeks; still, mothers did not eat "indiscriminately" and were always on the alert for sensitivities that may be particular to their baby. In addition, a few tried to stay away from the foods they believed might cause their baby to have gas for fear of the possible consequences of experimentation. It was important to mothers to ensure that the gas their babies did have was theirs alone and not "induced" by them. Only one mother questioned whether gassy foods affected breastmilk.

She stated:

> You know, maybe, they [mothers] are so subject to old wives' tales that they really think they're gonna hurt their baby by eating this, so then they eat it and they're worried sick, you know. Maybe they're nervous when they're holding their baby or something. The kid's panicking—like I'm so aware of my kids, when they've been upset, it's because I've been upset. [662, 6.1]

Some mothers were also careful about consuming "high allergen foods." These included foods such as dairy products (including milk), eggs, wheat and chocolate. A few mothers thought sensitivities to these foods might be observed in the baby as these foods, at least in part, are passed through the breastmilk, the most common example being a sensitivity to cow's milk. One mother wondered if colic might be related to a mother consuming these foods.

A few mothers mentioned that if environmental toxins were present in their food the toxins would be present in their milk. However, there was a feeling that this was something one could do little about.

Caffeine and alcohol were avoided or consumed in small quantities to protect infants from any untoward effects from these substances. One mother was so concerned about the effect of alcohol on her baby, she withheld the breast and supplemented with formula for twenty-four hours after having one drink [386, 8.1]. Comments such as "You wouldn't give a baby coffee . . . " [1047, 9.2] or "you'll get alcohol milk" [656, 3.2] implied that mothers thought these substances passed directly through the milk. Observations of their infants suggested that babies experienced similar effects from these substances as the mothers consuming them. For example, it was noticed that drinking coffee or Coke® would cause a baby to be more awake or "hyper," while alcohol would make a baby more sleepy. Only one mother thought that caffeine could have a positive effect—that of helping children to sleep. She learned from a pediatrician that caffeine may not have the same effect on children that it has on adults because their bodies were not developed enough to process it in the same way [882, 6.2]. She drank two to three cups of coffee a day while she was nursing and did not notice any ill effects from this in her children.

Although most mothers agreed that the nicotine from smoking could negatively affect the baby through the breastmilk, most were not sure what the effect would be. Two informants did smoke while they were lactating. One only knew that "it wasn't good." The other thought nicotine could make a baby more restless, produce nausea and decrease their appetite. Despite these beliefs, both continued to smoke, although they stated that they "cut down" on their smoking during the time they were nursing. Neither mother noticed any untoward effects of smoking reflected in their infants' behaviors.

All mothers were aware that medications taken by a nursing mother could affect the baby. They tried to avoid taking medication, but if this was not possible, they made sure the medication was "safe for baby." Some mothers believed that birth control pills could adversely affect the quality of the milk, but no one was sure what affect this would have on the baby.

The influence of maternal health on the quality of breastmilk was also discussed by some mothers. Mothers who had been sick or experienced breast infections during the time they were nursing had not noticed any differences in their infants' responses to the milk that might suggest a change in quality. One mother thought illness lessened the quality of breastmilk because the mother was not eating as well as she normally would. She had also worried about her cold being transmitted to her infant through the breastmilk. Another mother wondered if AIDS could be passed on to the baby through breastmilk. Also, mothers were uncertain whether the commencement of menstruation or pregnancy would influence the quality of the milk.

Knowing the Milk is Good

Knowing whether the quality of the milk was good was difficult for mothers: "Like I can't see how the mother would really know whether or not it's good....Other than [by] what you've eaten and stuff" [1315, 8.2]. The nutritional value of the milk could not be accurately evaluated by looking at it. In fact, to many mothers the milk looked thin and watery. Although mothers knew they could have their milk tested, none of the informants

had considered doing this. At least one mother was skeptical about the results of these tests in any case. She attributed findings that the milk was not "good enough" to only the foremilk being tested.

For the most part, mothers reassured themselves that the milk was good by observing the reactions of their infants. If their babies were content and gaining weight, they could be confident that the milk was meeting the babies nutritional needs. The knowledge that they were only "putting good things in" to their bodies provided added assurance that only "good things were coming out."

Working on Finding a Balance

> Get enough rest, eat three meals a day. I mean, heavens, that's the ideal and I think that as you sort of get on in this life you realize that there are ideals and there are, you know, the realities of what happens. And if you can just find your way somewhere in all of that in all of those words find out what works for you. Then it's [producing milk] almost effortless....It's...still very individual from mother to mother and you have to find your own way. [1566, 1.2]

Finding a balance in the production of milk that met both the baby's nutritional needs as well as mothers emotional and physical needs was not always easy. Mothers felt bad if their infants did not have enough milk and felt physically uncomfortable when there was too much milk. They knew that they needed to eat balanced diets to ensure the production of milk and yet it seemed that there was little left they could eat that would not produce undesirable reactions in their infants. Some mothers believed getting "too wound up" about diet was counterproductive, yet most felt they could not eat "indiscriminately."

Mothers recognized that their bodies also played an important role in finding this balance. When lactation was well established, their breasts "knew the routine," and their bodies were "settled back down" and "sort of lazy," only producing as much milk as was necessary. Milk was there when their babies were hungry. There was enough milk to keep the baby satisfied and no left-overs that could cause problems for mother.

Mothers also knew that their breasts could and did "adjust" to the changing demands of their infants. One working mother's comment indicates that some mothers clearly

depended on this :

> My poor breasts, Monday to Friday they have to do one thing and Friday night to Monday morning they have to do another thing.[1092, 1.2]

At work on Monday and Tuesday her breasts felt full. By Wednesday they had adjusted to the routine of less breastfeedings and she was more comfortable. These changes, however, were not instant and required that both mother and baby be patient. Another mother explained:

> Like in between those four hours, they may nurse the baby and the baby really isn't getting anything. It will eventually, but...usually they panic, and oh, there's no milk—and that's true. But they would have to wait it out and the next day they would have it. And the baby might be cranky and crying that first day because it really doesn't get enough. But if they would persist, they would get more than enough. But they have to sit there with the baby at their breast all day and half the night, maybe. [1344, 2.2]

Even though waiting and trusting that the body would adjust seemed important in achieving the right balance of milk, mothers had to expect that there would be days that would either be difficult for their babies or themselves.

Dealing with the Drips

All mothers experienced some leaking with engorgement in the first few weeks of breastfeeding. However, after the milk had "settled down," the leaking decreased and, for some mothers, stopped entirely. While these mothers considered themselves "lucky," at least one mother thought that not leaking might be a sign that she "didn't have enough milk." For others, "the leakers," as one mother referred to them, milk continued to leak throughout the duration of their breastfeeding experience. For these mothers, learning to accept leaking milk as a part of breastfeeding became an important part of their success. No one was certain why some mothers became leakers and others did not.

For the most part, leaking was uncontrollable. It was something that just happened, "whether you wanted it or not." While most mothers could never be sure of when they would leak, "leakers" could always expect it to happen. All mothers thought that they

could not prevent leaking from occurring, but some mothers discovered they could control leaking by putting pressure on their nipples.

Most mothers saw leaking as inconvenient, especially when they were not feeding or were out in public. It was inconvenient to have to wear nursing pads and inconvenient to be without them when leaking. Leaking was considered more tolerable if you happened to be at home, had a hungry baby or were trying to express. Leaking milk was also seen by some mothers as providing assurance that there was lots of milk for their babies. If you were overflowing, there must be an abundance of milk. However, most were embarrassed when the amount of milk leaked was sufficient to show through clothing becoming obvious to others.

Reasons for leaking. Based on their experiences, mothers attempted to identify factors that seemed to be connected with leaking. For some mothers, leaking was associated with the let-down reflex. When they thought of their babies or it was close to feeding time, the let-down reflex allowed the milk to flow, and with this, leaking occurred. For the same reason, it was not uncommon for milk to leak from one breast while an infant nursed on the other. Sometimes mothers found that the force of the let-down reflex caused the milk to literally squirt out or leak in such large amounts that their clothes would be "drenched" with milk in just a few minutes. Heat from hot compresses or from a warm shower seemed to precipitate leaking for some mothers. Mothers also noticed that when they were feeling engorged, or "full," they were also more likely to leak. For mothers who did not usually leak, this provided concrete evidence that their milk production was increasing in response to an increased demand from their infant. While one mother wondered if the reason that she leaked was because she nursed "too much," another thought that the reason she did not leak was because her baby was such a "snacker." When mothers began to nurse less frequently, they noticed leaking diminished in accordance with the decrease in their milk production. Some mothers also noticed that they leaked milk during intercourse.

Mothers who did not thought it was because the baby had emptied their breasts prior to having intercourse or that it just fit with the overall picture of them not being a leaker.

Living with leaking. Mothers found leaking milk to be "sticky", "messy" and uncomfortable. One mother explained:

> ...it would sort of leak in the clothes and so you wouldn't really notice it. And then all of a sudden like he'd be finished or something or I'd go...ohhh! And it would get really cold really fast and then you'd feel all you know wet and cold and I couldn't stand it. It's kind of like uhhh, you know, get this off of me....It was just uncomfortable. [738, 3.1]

Having to wear breast pads and heavy bras added to the discomfort. No one found leaking particularly pleasant. Leaking was simply a "pain in the neck." For some, it was a "problem" that mothers had "to cope with." For others, it was something that a mother had to learn to accept and "take in stride." One mother who was nursing her second child compared leaking to menstruation:

> ...it's [leaking] a part of my life. Breastfeeding is a part of my life right now and so I take what comes with it. I suppose it would be similar in some ways to menstruating. You just do what you have to do to be as clean as you can and to get through the phase in the best way that you can. [146, 1.2]

As reflected in one mother's experience, perceptions of the whole experience of breastfeeding seemed to be influenced by one's attitude toward leaking. Recollections of her first breastfeeding experience include a colicky baby, feeling uncomfortably engorged and having to "put up" with leaking. She believed that her "negative" feelings about leaking milk while nursing this baby contributed to her decision to stop breastfeeding after two months. Nursing her second baby has been more enjoyable, and she found she has been able to "tolerate" the leaking. Some mothers thought that "younger" and "first time mothers" who want everything to be "perfect" were more likely to have a difficult time accepting leaking milk.

One mother found it easier to accept the leaking "for breastfeeding reasons" than the leaking that occurred during intercourse. Leaking during intercourse was "annoying," and

she wished it did not happen, although another mother did not share this concern. For her it was just part of breastfeeding.

Managing the leaking. Most mothers were "afraid" they might leak and went to great lengths to ensure that leaking milk did not show. To "protect" themselves, they wore breastpads, heavy nursing bras and even chose particular styles and colors of clothing that would conceal any milk that might leak through. Mothers found it embarrassing to have spots of milk on their clothes and were also sensitive to the reactions others might have. One mother states: "If you leak or something, sombody'll notice and they might think that's offensive 'cause you shouldn't've" [303, 8.2].

Even at night, mothers tried to "prevent leakage" by wearing their pads and bras to bed. This practice continued for as long as mothers leaked. When mothers tried to give this up too soon, they found themselves washing bed sheets the next morning. One mother explained that finding the right time to do this was a bit like "Russian roulette" [1091, 6.1].

Some mothers tried to deal with leaking by putting pressure on their nipples to stop leaking. But as one mother explained did not always work:

> It depends if you can—you know, how soon you catch it and how hard you're pressing. If you can't press hard 'cause there's too many people around...or you can't even press sometimes. You know, it's just got to come—well, what are you gonna do? Maybe you're wearing a suit, so it won't—you know you'll be able to cover it up. It just gets your blouse wet. But there isn't really that much you can do about it. [101, 2.2]

Mothers also attempted to control leaking by removing milk from their breasts by expressing or nursing their infants. Most mothers did this for their own comfort. Only one mother thought that she should stop the flow of milk to ensure that there would be something left for her infant [893,5.1]. Some mothers were reluctant to express milk as a way to decrease leaking if they believed it was related to engorgement. Expressing was seen as counterproductive because it would build up the milk even more.

Relieving the Discomfort of Milk

Mothers often experienced discomfort from the milk that lay in their breasts. This discomfort emanated from engorgement, "feeling full", blocked ducts and breast infections. To mothers, engorgement was something that "just happens" during the initial weeks of lactation. There was no way of avoiding it. One mother's words summarize the experience shared by most:

> ...when she's first born and your milk comes in. I mean, that hurt....I mean, certainly a few times you're going, ah! What's going on? What's in there? It's so big and hard you can't even think that it would be milk, or you...envision the worst giant tumors in your breasts or something....The next day you tell yourself, really—this is really all it is. [650, 7.1]

On the other hand. "feeling full" was something that could occur daily throughout one's experience of breastfeeding. Breasts could feel "heavy" and "sore," but the discomfort was significantly less than the initial engorgement mothers experienced. For one mother, it seemed that she was "just barely holding the milk in" when it came time to nurse. Mothers "felt full" when they were late for or missed feedings. This mother's experience is representative:

> You [don't] get so full because now it's much more, I guess it's just settled. Your breasts know the routine of when your baby normally eats. So I mean, they are not making so much milk that you can't handle it. But...like if I go out in the morning and I don't nurse her before I go, say at nine, by noon I am sore. Even now and she's 15 months old. [554, 2.1]

Mothers also experienced the discomfort associated with feeling full when their babies did not nurse "normally." If a baby slept through the night or nursed more frequently than usual, mothers experienced a "build up" of the milk.

If it was possible, mothers simply "relieved the pressure" of the milk by nursing their infants or expressing a little milk. Mothers found that even if they had to wake up their infants or nurse them after they were fed a bottle by the babysitter the removal of even a small amount of milk in this way brought instant relief. One mother, who was nursing a toddler when her second baby arrived, had the older child come into hospital to nurse to "help her out." Warm compresses or warm baths also alleviated the discomfort. When

mothers were away from their infants and breast pumps were forgotten or there was not time to express, it became a matter of just enduring the discomfort. Sometimes the feeling of fullness would just "pass." At these times, mothers kept a eye out for any obvious signs of leaking. While no one wanted to leak, a few mothers thought that leaking might help to relieve some of the discomfort. With the build up of milk at night, mothers found that they had to sleep on their backs and one encouraged her husband to "stay away" from her breasts when they were sore.

Blocked ducts were painful events for mothers who experienced them. As one mother said, "...it feels like you've got a rock in there and it just hurts so much" [650, 7.1]. One mother, in particular, had a difficult time with blocked ducts while nursing her third baby. In a period of four weeks, she went through four episodes of blocked ducts. Her words clearly reflect her anguish as she tried to "unlock" the ducts:

> ...after they were emptied they just throbbed and throbbed, five or six hours of pain. And I don't know why. Nobody can tell me why I was in such pain....Every time she nursed I just felt like I was going to shoot through the roof. I just bit the bullet for week after week, and I thought after two weeks, that'll—it'll stop you know, and it'll—I'll recover. Something will be all right. But for some reason this breast can't take it anymore. [So what did you do to try to unblock the ducts?]...I sat and soaked in there [a tub of hot water] and I tired to express—and expressed and pressured the ducts, trying to get them free, and it didn't work. And I could see this white kind of dot on the end of the breasts where it seemed that's—you know, where it was blocked, and I tried—and I squashed the nipple. And I should never have done that, but I didn't know. I was desperate. I was so desperate I felt like shoving a pin down—you know, I mean sterilizing a needle and just jabbing it in. [1996, 6.1]

After much experimentation and some good luck, she found that the best way to unblock the ducts was to use the heat of warm water to "soften whatever was blocking them," followed immediately by having her baby nurse. Although releasing the block brought relief from the pain, for days after she felt "totally in a down" and ill. She stopped nursing because of these problems when her baby was six months old.

Breast infections seemed to pose less of a problem for mothers. Antibiotics and continuing to nurse were effective strategies to quickly overcome this problem.

The Pay-Off

Mothers found that there were both emotional and physical pay-offs related to producing milk. Being able to nurture their children on something they alone produced brought a great deal of satisfaction and increased their self-esteem as a mother. The longer mothers breastfed, the more convinced they became that they were "doing the right thing."

Providing breastmilk also freed mothers from any guilt related to the present or future health of their children. By feeding a child breastmilk, a mother was providing the "best start" in life possible. For one mother this provided an important reason for continuing to breastfeed:

> I said to my husband, you know, man, I'm going to stick it out so that I don't have any regrets. You know, and that was one of my main reasons for breastfeeding, too...I don't want to have any regrets, you know, when I'm fifty or sixty or eighty years old, and I've got sick, sick, sick kids or something. I don't want to have any guilt. [2209, 6.1]

While some mothers believed that the closeness that grew out of breastfeeding was totally related to the act of breastfeeding itself, others thought that the breastmilk played an important part in the development of this bond. One mother explained:

> I think breastfeeding has endeared me greatly to these kids. I mean I can't even spank them because they are so much a part of me....'Cause they are a part of my body. I guess that's how it works. [794, 2.1]

In addition, being solely responsible for producing milk for a child made it less convenient to make a choice to leave a baby by itself. The mere fact that mothers and babies needed to be in close proximity to maintain the production of milk enhanced the likelihood of developing a special closeness with a child. Mothers wanted to be close to their children and saw producing and giving their infants breastmilk as enhancing that closeness.

Delayed resumption of menstruation due to lactation was viewed by all mothers as an added bonus. After nine months of pregnancy, mothers were not anxious to "go back to it again." For some, not menstruating meant they could avoid the mood swings usually experienced with menses and that their complexion was always clear. For others, not

menstruating was simply "wonderful." While all mothers believed that the risk of becoming pregnant could be less as long as they were not menstruating, they also thought that one could not depend on this as a form of birth control. One mother who wanted more children found that lactation provided a way of spacing her children. She believed that by frequently nursing at night she could prevent her periods and, therefore, avoid getting pregnant. With each child, she found that her periods resumed at about eighteen months. Shortly after that she would be pregnant again.

For some mothers, lactating improved their figure. Their breasts were larger and they soon lost any extra weight they gained during their pregnancy. As one mother said, "You look great—big boobs and slim all over" [1325, 7.2]. Some mothers also noticed that when they began breastfeeding they could feel the muscles in their stomaches tightening, helping them get back into shape more quickly. Weight loss for those who did lose weight while they were nursing was effortless. The pounds just disappeared.

The Costs of Producing Milk

Establishing and maintaining a milk supply was not "all red and rosy." Several mothers openly acknowledged that they continued to nurse because it was the best thing for their babies even though it was not the best thing for them. While they were lactating, some mothers felt completely drained of energy. Several mothers found that this was particularly evident after the first few months of nursing. One informant summarizes the way many mothers felt:

> I just feel like I'm dragging myself around...your body uses so much energy to produce that milk. It just seems like every morsel that's available it uses to make that milk....As soon as that lactation ends, oh it's like night and day. Soon as my hormones kick in again, man , I can just fly....Exhaustion's really a negative thing. Anyone who can stick out nursing now, I just have to really admire. [930, 6.1]

Being up at night to nurse and too busy to catch a nap during the day added to their fatigue. For others being tired was related to keeping up with the demands of a "big" baby and not being able to get a break from nursing.

Mothers found maintaining a milk supply a "sacrifice" in other ways as well. To nurse as frequently as was necessary required time. Mothers had to be willing to give up many of the activities and hobbies they previously engaged in. One informant said, "It puts a lot of restrictions on your time, you can't just run out and go and meet a girlfriend for lunch whenever you want....You can't have eight hours' sleep all the time" [1467, 4.1]. Even if someone else gave the baby a bottle, most mothers thought they would still have to spend time expressing their breasts. When a baby refused to take a bottle, there were no breaks. Besides the time it took to nurse an infant, some mothers also spent time before each feeding trying to "unwind." Finding time between feedings to take other children to school activities, to do the banking and grocery shopping and to keep up with household chores was difficult. The time that it took to keep up the supply was the hardest part for some mothers. One mother said, "I just felt that there wasn't enough time to do everything. And it—you know, it's starting to burn me out" [1657, 5.1].

Being "tied down" to breastfeeding and producing milk was also viewed as a big sacrifice for nursing mothers. The unpredictability of demand feeding seemed to restrict mothers' freedom the most. One informant explained:

> It really ties you down. Because she wasn't on a schedule, she may want it now and then twenty minutes from now....Like I wouldn't know if I fed her [that] I'd have two hours to go to Safeway. It didn't work that you, you know. I just felt I always had to be here for her. [258, 5.1]

There were also "dietary restrictions." Mothers did not feel free to eat or drink what they wanted. For the mothers who did not lose weight while they were nursing, plans to lose the extra weight that they had gained over their pregnancy had to be delayed until they had finished breastfeeding.

For some mothers, the process of lactation engendered worry and feelings of guilt. Some mothers worried about whether they had enough milk and/or whether their milk was good enough. Mothers also found themselves feeling guilty when their babies appeared to

be upset from their breastmilk, when they stopped nursing and when they did not. One mother felt it was "selfish" of her to continue to nurse. She explained:

> Breastfeeding is great but I think that I want it on my terms because obviously that's convenient for me this way. So as long as it's convenient for me I guess I'll keep doing it. you know it's selfish in that way because I still like to do it and I still can do it therefore I still will do it at little or not cost to me. So it's a very selfish, selfish reason. I'm selfish because I still want the experience of doing it. [1462, 1.2]

Another, who was feeling exhausted and had several recent painful episodes of blocked ducts wondered if it was selfish for her to stop nursing when her baby was six months. She rationalized that to spend more time with her children and still be able to earn the money she needed to live weaning was necessary .

Summary

Mothers' descriptions of breastmilk and their perceptions of their role in managing lactation have been presented. Although mothers were hesitant about being able to discuss breastmilk, it is clear that they hold significant beliefs related to breastmilk as a food and the process of lactation as a body function. Although the appearance of the milk sometimes perplexed them, mothers knew that breastmilk was the best food for their infant. A variety of prescriptions and restrictions have been identified that mothers believe to be important in ensuring the quality and quantity of breastmilk. In addition, mothers' experiences related to managing breastmilk have been described. Mothers made their own discoveries about breastmilk and relied on their own experiences during lactation to validate the things that they had heard or read about related to breastmilk. The significance of these findings are discussed in Chapter V.

V. DISCUSSION

The purpose of this study was to examine breastmilk from the perspective of breastfeeding mothers. An inductive approach was taken because an analysis of existing literature revealed that studies investigating beliefs about breastmilk among Canadian women are virtually non-existent. The findings of this study indicate that mothers have a complex pattern of beliefs related to breastmilk and the process of lactation. Understanding belief systems related to breastmilk is clearly an integral part of understanding mothers' infant feeding decisions.

The purpose of this chapter is to discuss the findings of this study in light of existing work on breastmilk and breastfeeding. The material is presented within the following structure: 1) discussion of the research methods; 2) discussion of findings; 3) implications (nursing and research); and 4) summary.

Discussion of the Research Methods

Methods. The ethnoscience method was used in this study because it allowed the investigator to explore mothers' concepts of breastmilk by eliciting and analyzing their own words and frames of reference. This method is based on an ideological approach to culture which assumes that culture is composed of "psychological structures by means of which individuals or groups of individuals guide their behavior" (Geertz, 1973, p.11). Hence, the necessary prerequisite to understanding what individuals actually do is explication of the internal view that individuals have of their own actions, values and feelings (Werner & Schoepfle, 1987). Using the ethnoscience approach, the researcher strives to reveal the most salient issues and concepts that are significant from the informant's cognitive perspective. In this sense, this approach was useful and was consistent with the purpose of this investigation. The resulting findings do not represent the beliefs of any one individual but describe the composite beliefs derived from all informants participating in this study and, therefore, represent the beliefs of an "idealized omniscient" individual (Werner & Schoepfle, 1987). Although this approach has the potential of obscuring

contractions that exist between individuals, attempts have been made to elicit and explain variations between informants' belief systems. The degree to which behavioral events can be predicted from knowledge of cultural rules remains a topic of debate (Geertz, 1973; Harris, 1979; Pelto, 1981).

Techniques. Data was collected in this study using ethnographic interviewing. The use of unstructured interviews made it possible to fully explore conceptualizations of breastmilk using the language of informants. Most mothers initially thought they had little to say about breastmilk and looked to the researcher for direction. This comment by one informant was not unusual: "I don't know what I can tell you about breastmilk. Why don't you ask me some questions." This initial anxiety diminished with introductory grand tour questions, such as "Tell me about the first time you saw breastmilk. What did you notice about it?" Attempts to encourage mothers to relate their own perspectives and experiences rather than the "facts" about breastmilk they had read were largely successful. However, mothers often found it difficult to focus on breastmilk. For example, in answering a question about breastmilk, mothers often formulated answers in terms of breastfeeding. In these instances, the researcher tried to verify if the answer given was really about breastfeeding or breastmilk and, if necessary, redirected the focus back to breastmilk. Mothers enjoyed the card sort techniques and much useful conversation occurred during the sorting. They were reluctant, however, to complete multiple sorts of the same cards. Only one subject agreed to do this when the card sorts were divided between two interviews. In retrospect, they were probably given too many cards to manage multiple sorts during one interview. It would have been useful to schedule interviews closer together and divide card sorts over two interviews.

All interviews, with the exception of two, were conducted in informants' homes. Although this environment provided a convenient and comfortably relaxed setting in which to conduct the interviews, there were times when the home setting hindered an interview. Occasionally, informants were distracted by children, telephones or visitors. One

informant was interviewed at her place of work. More interviews were held with this informant to overcome time constraints imposed by the work setting. Participating in this study provided the opportunity for mothers to reflect on their own beliefs and experiences related to breastmilk. This was something they did not often talk about with friends, and they enjoyed the opportunity to share their ideas with someone else.

Use of statements related to breastmilk retrieved from the project on breastfeeding and working mothers as a secondary source provided useful comparative data from which additional questions for exploration with the informants in this study were drawn. In addition, this data was used to verify findings of this investigation.

Discussion of Findings

Descriptions of Breastmilk

The Appearance of Breastmilk. In eliciting mothers' constructs (descriptions) of breastmilk, it is interesting to note that mothers rarely used scientific terminology, such as protein and lactose, to describe breastmilk. While they saw it as simply containing "nutrients" and "vitamins," mothers generally did not perceive their milk to be chemically contrived. To mothers, breastmilk was a "natural" food (i.e., species specific) and, therefore, better. Mothers were concerned about the appearance of the milk and were highly aware of the benefits of breastmilk for their infants. Their use of fat-related terms (e.g., lean, creamy, rich) to describe breastmilk may be reflective of the influence of underlying cultural dimensions of food, especially their fattening properties discussed by Worsley (1980) and cultural expectations that healthy babies are if not fat, at least "filled out." Breastmilk was also frequently described and evaluated by drawing comparisons to cows' milk and infant formula as if there *should* be some similarities between the three. The surprise that some mothers experienced in discovering breastmilk to be "so thin" suggests that mothers hold expectations of what breastmilk should be like that may be incorrect. Mothers' expectations about breastmilk may be reflective of the "imprinting" of

visual aspects of bottle feeding on a large proportion of the population (Fisher, 1985) and the prominence of cow's milk in our diet. Promotions which indicate that infant formulas are striving to approximate the composition of breastmilk as closely as possible may also suggest to mothers that breastmilk and formula should also be quite similar in appearance. In addition, evidence of the influence of baby food manufacturers on mothers' notions of what constitutes a proper solid food for babies (Adair, 1983) provides some support for the hypothesis that infant formula companies may also be influencing mothers' perceptions of what constitutes a 'proper' milk for babies. It is also interesting to note that cows' milk and infant formula were seen as appropriate measuring sticks against which to compare breastmilk, rather than the other way around. The comment that breastmilk was "not as filling as formula" clearly reflects this bias.

Despite the fact that mothers thought breastmilk was the best food for their babies, some mothers still found it incongruous to think that something that looked like water could be all a baby needed. Mothers expected breastmilk to be "rich" and "nourishing" and, therefore, *thick* rather than thin, *creamy* rather than watery, and *white* rather than having a blue tinge. Several studies have reported that mothers who believe their milk to be weak wean their infants (Newson & Newson, 1962, 1974; Wallace, 1980). If mothers do not know what normal breastmilk should look like or how it could be nutritious despite its appearance, it is possible that they may mistakenly believe that it is weak.

To see if mothers' expectations of breastmilk may have been influenced by what they read, several books were reviewed that were written specifically for breastfeeding mothers. Woessner, Lauwers, and Bernard (1987) describe in detail the unfamiliar appearance of breastmilk, identify commonly observed variations and attempt to reassure mothers that despite the appearance of breastmilk, it is ideally suited to an infant's needs. However, others inform mothers of the composition of breastmilk rather than clearly describing its appearance (Eiger & Wendkos Olds, 1987; La Leche League International, 1981) or include information that may be confusing to mothers. For example, Pryor (1973, p. 44)

states, "Whatever kind of mother a sample of milk comes from, it still looks like milk, smells like milk, tastes like milk....If it is left to stand the cream will rise. Be it the milk of a human, cow, or rabbit it is capable of being made in to cheese or butter and will go sour in the same way. Whatever the source, milk is milk." Reading this a mother could assume that human milk would be very similar in appearance to cow's milk.

The benefits of breastmilk. Although the unique nature of breastmilk is still not totally understood, the nutritional benefits and immunological significance of breastmilk in comparison to other infant foods have been supported through scientific research (Lawrence, 1980). In spite of this, Minchin (1985) suggests that a climate of opinion has been created in which breastmilk and formula are thought to be much the same. However, the mothers in this study, like other Canadian breastfeeding mothers interviewed by Maclean, Byrne, Gray-Snelgrove, Ferrier, and Katamay (1985) and Yeung et al. (1981), did not share this opinion. While they did not fully understand the complexity of human milk, they firmly believed that breastmilk was absolutely the best thing they could give their infants to meet their nutritional needs as well as to ensure their physical health. Any amount of breastmilk that could be given to a baby was thought to be better than nothing, especially in the first few months. Some mothers breastfed at significant personal expense and physical discomfort just to do this. Like women elsewhere (Gabriel et al., 1986; Rapheal & Davis, 1985), these mothers never doubted that breastmilk was best. It upset them to watch women formula feed infants or "give up" breastfeeding "so easily." A few also gave the bottle because they had to go out to work or study and, sometimes, because they had problems keeping up their supply of milk.

There was, however, less agreement as to the importance of breastmilk when a baby was three to six months of age. Despite the fact that mothers had heard that babies should be breastfed exclusively for six months, it seemed that once babies were over three months of age and there were obvious signs that they were healthy and strong from the good start breastmilk had provided some mothers felt there was less of a need for this specialized

kind of food. Fears of not being able to keep up with increasing demands for milk also prompted some mothers to consider formula at this time. These fears may be valid considering findings, based on measures of milk volume of lactating mothers in The Gambia and England, which suggest that mothers' milk production increases for the first three months and then "thresholds," followed by a slow decrease after a few more months (Whitehead, Paul, & Rowland, 1980). Even if they are breastfeeding well, some mothers may not be able to produce enough milk for their infants. On the other hand, it has been observed that exclusively breastfed infants were able to maintain normal growth patterns even though their caloric intakes did not conform to currently accepted standards (Wood, Isaacs, Jensen, & Hilton, 1988). An explanation for the less then expected intakes may be related to the greater digestability and availability of nutrients of human milk. These findings suggest that mothers may not need to be worried about what they feel may be an insufficient volume of milk. Mothers' change in attitude towards the importance of breastmilk may be related to infant growth spurts and developmental changes occurring between four to six months. Others have argued that these changes are interpreted by mothers as signs that indicate that an infant is ready and able to wean (Brazelton, 1974; Clarke & Harmon, 1983; Williams, 1986).

Mothers who believed that breastmilk was an important food up until six months and beyond were often mothers who suspected they had allergy prone children or who saw their infants as babies that still needed the nutritional and immunological benefits breastmilk could provide. The strength of their conviction was often reflected in the guilt they experienced as they thought about stopping to breastfeed. Some mothers avoided making a decision to wean their infants by waiting for their infants to take the lead in stopping. Several used developmental milestones or infant behaviors related to nursing (e.g., "playing at the breast") to excuse them of the responsibility in providing milk. Others used seemingly objective and external factors (e.g., having surgery, problems with blocked ducts or thrush) to justify weaning, believing this relieved them of the

responsibility of terminating the relationship. They felt less guilty because the decision to wean was, at least to some extent, beyond their control. To remove the comfort that breastfeeding provided for the baby and to remove a valued nutritious food from the infant's diet for a mother's personal reasons was difficult to justify.

As the child grew older and solid foods were introduced, breastmilk was viewed as a less critical component of the infant's diet. This was partly because mothers assumed that their infants were getting less milk because they were nursing less frequently and because their infants were receiving the nutrition they required through solid foods. When breastfeeding continued for "comfort" reasons, breastmilk took on even less importance. Some mothers described breastmilk as an "added treat" at this time, suggesting that it was something that the child could do without. The comfort a child received from nursing was seen to be related to the breastfeeding act itself and not to the breastmilk. Only when children were sick did some mothers recognize the physical comfort that the milk could provide. Emotional comfort remained in the domain of breastfeeding. While food is recognized to be a source of nurturance in this culture, it is interesting that mothers did not attribute any emotional comfort to the milk itself. When feeling alone, unhappy or anxious it is not uncommon to replace the loss of comfort and acceptance from significant persons or to reduce tension by giving one's self food (Babcock, 1948; Rubin, 1967). These self-feeding sprees meet a psychological rather than a physiological need. In addition to the pleasure provided through sucking, it seems possible that breastmilk could be a source of nurturance for an infant. This notion seems to be supported as several informants observed that there were times that their infants wanted to nurse "not for hunger" but because they needed to be comforted, for example, when they were tired, hurt or bored.

The reaction of an infant to breastmilk also played a significant role in influencing mother's perceptions of breastmilk. Any signs of distress or of the infant not being completely satisfied were often attributed to problems with the milk. If a baby seemed to prefer breastmilk, looked healthy and was content between feedings, mothers credited this

to the goodness of their milk or the adequacy of their supply. Colicky babies caused breastfeeding mothers a great deal of concern as they searched for possible reasons their milk upset the baby. Conclusions that they were not being careful enough in watching their diet brought increased guilt. Only a few mothers thought that breastmilk was not related to colic and that, in time, the problem would resolve itself.

The appropriateness of breastmilk as a food. Although mothers recognized that breastmilk was a bodily secretion, they were adamant that they did not think of it in this way. To mothers, breastmilk was primarily a food. Yet while they abhorred the use of the word "offensive" in relation to breastmilk, relegating it to the perceptions of those who disapproved of breastfeeding, mothers demonstrated reluctance and embarrassment in tasting their own breastmilk. Although they did not find the actual taste or appearance of breastmilk to be objectionable, it appeared that their distaste for breastmilk was associated with the thought of tasting and eating something that was produced and secreted by their own body. In this way, mothers' thoughts about breastmilk as a food for themselves seems to be similar to students surveyed by Fallon and Rozin (1980) who thought breastmilk was "disgusting." Morse (in press b) suggests that the expectation that mothers at work should express their milk in the bathroom may reflect attitudes that breastmilk is an excretory function and that it is considered dirty and defiling. She also includes the following story reported when a mother was asked if she has tasted breastmilk. " 'Well,' the mother replied, 'one evening I wanted to make Kraft® dinner for supper, but we were out of milk. So I took one of my frozen baggies....Dinner was delicious! But if my husband ever found out...! '" (Williams, cited in Morse, in press b). Perhaps the common practice of mothers placing bottled breastmilk in a brown paper bag in the refrigerator (especially when it is someone else's) is also a reflection of these attitudes toward breastmilk (Morse, personal communication, 1988).

It is interesting that for the mothers in this study this attitude towards breastmilk did not seem to preclude them from breastfeeding or interfere with their belief that breastmilk was

the best thing they could give their babies. It is not clear how they were able to reconcile these seemingly disparate attitudes. However, one was thing was apparent. As children grew older, the appropriateness of breastmilk as either a necessary or supplementary food diminished. Just as there are foods reserved for illness or for holidays (Rubin, 1967), most mothers believed breastmilk was a food for babies only. The possible influence of this attitude on infant feeding decisions has been recognized in the work of others. Morse (in press b) describes the way this attitude toward breastmilk could influence infant feeding decisions when she poses the following question: "Is it possible that breastmilk is sanctioned for the newborn, but when the infant acquires characteristics such as speech, the ability to walk or teeth to eat—in short, becomes an aware *person* —then breastfeeding is no longer considered an appropriate food, and the infant is weaned?" This is supported by researchers who have found mothers to wean infants when developmental milestones are reached (Clark & Harmon, 1983; Williams, 1986). Attitudes related to the sexual aspects of breastfeeding may also precipitate concerns about children becoming sexually excited as they become older and more aware while breastfeeding. Morse (in press b) believes that it is possible that fear of incest may be embedded in attitudes toward breastmilk as an infant food.

Breastmilk from a sexual perspective. Breastfeeding is a sexual experience which, in part, includes the "buildup to breast fullness as the baby gets hungry, the speed with which the breast respond with warmth when the baby cries, [and] the erection of the nipple as the baby seeks it" (Kitzinger, 1983, p. 225). Breastmilk appears to play a significant role in this experience. Yet, it is interesting that few informants were aware of or felt comfortable talking about the sexual aspects of breastmilk. When asked if there was anything sexual about breastmilk, most mothers were quick to deny any such connection. However, most described the emotional pleasure they experienced while breastfeeding. One mother's comments were typical. She stated: "I think the only feeling I really got from having the milk supply for my baby is feeling very wholesome. Like this is the way it should

be...having my baby nurse from me was such a feeling of [being] whole, like being a woman" [928, 5.1]. One mother experienced some ambivalence about the purpose of her breasts when she was lactating. For her, they were no longer "sexual things" but rather "feeding tools" and, therefore, off limits to her husband. Mothers' practice of wearing bras and nursing pads to bed may be as much a way to prevent breast stimulation from their partners for psychological reasons as to avoid leaking breastmilk on bed sheets. For at least one husband, keeping the ways a women uses her breasts separate was important—his wife's breasts were the baby's for the ten months of nursing. Only one mother discussed any sexual feeling directly associated with the milk. She thought that let-down felt like a "mini-orgasm," describing it as a "nice hurt." She was curious about the feeling that she experienced and thought it might be similar to an erection. Leaking during intercourse was discussed by some women only if questions were directly asked about this. It is clear that most women were not comfortable discussing sexual experiences associated with breastfeeding or breastmilk. In part, this may be related to the the fact that they viewed society's uncomfortable acceptance of nursing mothers and open criticism of the exposure of breasts in public for the purpose of breastfeeding as stemming from the belief that breastfeeding was sexual. To admit, even to themselves, that breastfeeding was a sexual experience was to side with this prevailing view and, therefore, limit themselves to breastfeeding behind closed doors or shouldering the added burden of shame and guilt about experiencing sexual feelings while feeding their infant in this way (Bentovim, 1976). Women who can accept and enjoy the sexual pleasure breastfeeding offers are more likely to be relaxed, producing and releasing enough milk.

Mothers' Perceptions Related to Quality of Breastmilk

Factors influencing quality. Many informants in this study were concerned about the quality of their breastmilk. They felt responsible for the quality of their milk and went to great lengths to ensure that the milk was "good enough." One mother's comments are reflective of the beliefs of most mothers in this study. She stated:

> I'm eating for the baby, so I have to eat better. You know, skip the junk food, skip the alcohol—I don't need it—and put the diet on hold for now. [903, 3.2]

Their belief that there was a direct relationship between what they took into their bodies and the breastmilk they produced is similar to the findings of other researchers (Bryant, 1982; Gabriel et al., 1986; Williams, 1986). However, while this concern about the quality of milk is briefly alluded to by some researchers (Morgan, 1986; Newson & Newson, 1962; Wallace, 1980) focussing on the postpartum concerns of breastfeeding mothers, it is notably absent from other research (Graef, McGhee, Rozycki, Fescina-Jones, Clark, Thompson, & Brooten, 1988; Maclean et al., 1985). Morse (in press b) suggests that since the publication of Gussler and Briesemeister's (1980) study on insufficient milk syndrome researchers have focussed on mother's perceptions of the quantity of breastmilk while neglecting mothers' perceptions of the quality of breastmilk.

Mothers' concerns about dietary intake appear to be only partially supported by physiologists (Lawrence, 1980; Whitehead, 1983). Existing scientific data would seem to be more supportive of those mothers in this study who held the view that the body functioned to ensure the production of "good milk" and that an adequate diet served to enhance their own health. Research in a number of countries has shown that except in extreme maternal undernutrition the proportions of protein, fat, and carbohydrate in breastmilk remain relatively stable because maternal stores of nutrients are depleted, if necessary, to maintain the proper composition of milk (Jelliffe & Jelliffe, 1978). It has been observed that maternal diet can effect the constituents of the lipids in milk but not the total amount of fat. However, water soluble vitamins, such as ascorbic acid, thiamin and B_{12} levels are quickly affected by deficient diets. While there is general consensus that with malnourished mothers it is the total volume of milk that is produced that suffers rather than the quality of the milk, the success of dietary supplementation programs in improving lactational capacity is still unclear. Therefore, it appears that mothers' beliefs that more vitamins (in the form of tablets), larger amounts of nutritious food even when not hungry

and consuming richer foods (e.g., cream in place of skim milk) is not likely to make their milk any better. Lawrence (1980, p.135) states:

> Most writings for the nursing mother make the sweeping statement that maternal diet during lactation should be simple and well balanced with several glasses of milk and extra calories. All over the world women produce adequate and even abundant milk on very inadequate diets. Women in primitive cultures with modest but adequate diets produce milk without any obvious detriment to themselves and none of the fatigue and loss of well-being that some well-fed Western mothers seem to experience.

Besides ensuring the nutritional adequacy of breastmilk, mothers were also concerned about defiling their milk with substances such as caffeine, junk food, nicotine, alcohol or medications. Most mothers believed it was necessary to "give up" these substances while they were lactating. The basis of these beliefs appeared to be related to the assumption that "what you put in was what you get out." Effects of these substances on the infant were assumed to be similar to their effect on the mother. While there is a wealth of anecdotal information reflecting the views of the mothers in this study, the precise effect of social drugs, such as caffeine, alcohol and nicotine (Whitehead, 1983) and junk foods on the composition of breastmilk is still unclear. It is interesting that while lay publications do not prohibit such practices as smoking and consumption of alcohol or caffeine (Eiger & Wendkos Olds, 1987; La Leche League, 1981; Pryor, 1973; Woessner et al., 1987) mothers were often more dogmatic about forbidding or restricting these practices for either themselves or other breastfeeding women. Mothers also worried about causing harm to their infant by eating 'gassy' foods. The affect of maternal ingestion of 'gassy' foods (such as, cabbage and beans) on infants appears to be very individual, with some infants apparently not being affected in any way by their mother's diet. When an infant is affected by 'gassy' foods, it is usually during the early months when their digestive systems are immature.

Mothers believed that choosing to breastfeed included taking on whatever dietary and other proscriptions and prohibitions that they thought were required. However, it is possible that some mothers may be overly concerned about diet and other health related

practices and their influence on the quality of milk and that this may be counter-productive. For example, when a mother fears that she has not eaten well enough, this may inhibit the let-down reflex, thereby influencing both the quality and quantity of milk available to the infant. Some mothers in this study felt guilty if they drank Coke® or alcohol in moderate amounts, worried about the kinds of food they were eating and believed they needed to eat extra food even when they were not hungry. The consequential psychological and physical implications of this "over concern" on the process of lactation as well as the health of breastfeeding mothers needs consideration. The implications these beliefs have for other women who are making decisions related to infant feeding must also be considered. Weller and Dungy (1986) observed that mothers who bottle fed perceived that one of the main advantages of formula was that it guaranteed that an infant received complete nutrition when a mother was not eating right, on a diet or emotionally upset. However, others report that mothers do not believe in the unique benefits of formula when they say bottle feeding is better: rather, they talk about why they could not or did not want to breastfeed. Canadian mothers interviewed by Maclean et al. (1985) who chose to bottle feed described the diet necessary for lactation as "stringent," considered it undesirable to have to drink extra fluids and did not want to give up the foods they liked because of the dietary limitations that accompanied breastfeeding. Similar reasons for not breastfeeding were given by a sample of American women (Gabriel et al., 1986). If mothers hold unrealistic expectations about the kind of practices that are required during lactation, they may be more likely to choose to bottle feed. Also, if mothers perceive that maintaining the kind of dietary and health related practices they believe are necessary to produce good milk is dramatically different from their usual pattern of behavior, difficult to "stick to", undesirable or expensive, they may not be willing to breastfeed for an extended length of time. While changes in dietary and other daily habits may be important for establishing and maintaining lactation, they may also act as a barrier for some women in choosing to breastfeed or in continuing to do so.

Although it is characteristic of women in some cultures (Bryant, 1982; DeSantis, 1986; Fernandez & Guthrie, 1984), it is interesting that informants in this study did not believe that a mother's emotions directly influenced the quality of milk. They believed that a mother's anxiety or tension was "transferred" to the infant through the close physical contact characteristic of breastfeeding. The upshot being an upset baby that may not feed well and an increasingly tense or anxious mother who is not patient enough to allow the infant to nurse for as long or as often as needed. The quality of the milk, they believed, remained unaffected. However, some experts do not entirely agree with this. While Mead (1979) agrees that the relationship between mother and baby may be affected by emotional disturbances, she also believes that a mother's impatience may in turn be sufficient to cause simple changes in the chemistry of the milk, especially in the amount of fats, depending on whether the breast was fully emptied or not. Only one informant recounted a story told by her mother concerning the changes in the quality of milk. Apparently her mother had to stop nursing one of her children because the tension she was experiencing at the time affected her milk and "made the baby sick." The informant could not offer any explanation.

Variations in Quality. Jelliffe and Jelliffe (1978) state that the significance of variation in breastmilk is an "underappreciated" fact requiring further investigation. Although it has been reported that breastmilk varies in composition between mothers, fluctuates in fat content between fore- and hind-milk, is subject to diurnal variations (e.g., fat content increases from early morning to a plateau about midday) and varies over the duration of lactation (e.g., fat content decreases in later months), variations may be more complex than currently recognized. Jelliffe and Jelliffe (1978) suggest that composition may vary with individual need, possibly on a genetic basis or as a result of unappreciated mechanisms, such as alteration in details of suckling or even the weight of the baby. The views, however, appear to contrast with the beliefs of mothers.

While most informants recognized that there could be variations in the composition of milk (especially in terms of fat content) between mothers, they expected that if a mother's diet was adequate her breastmilk would remain relatively consistent throughout the duration of breastfeeding. Others believed that the body worked to maintain the consistency of the milk. With few opportunities to closely observe the milk over time and unsure of how they would recognize any variations if indeed they did occur, mothers simply assumed that the milk remained consistent in quality. As consistency was viewed as something desirable, this belief relieved many mothers of the worry about the quality of their milk. The fact that milk in a bottle has uniform composition throughout a feeding may also be influencing their expectations (Fisher, 1985). Only some mothers noticed more obvious changes in the appearance of their milk. One mother noticed that her milk did not have as much "cream" after the first two or three months of breastfeeding, a change that she believed went along with an infant's growing needs. Although a few were aware of normal changes in the appearance of milk associated with let-down, most mothers believed a well functioning let-down meant that the infant received more milk rather than richer milk. The fact that some mothers believed that the richest milk was at the beginning of the feeding may be reflective of observations that cream rises to the top and, therefore, is taken first. Beliefs that milk was richer at the first feeding of the day seemed to be related to a variety of factors including, breast fullness associated with less frequent feedings during the night, the assumption that with more milk there must also be more cream and observations that the infant was satisfied for a longer length of time after this feeding than others during the day. For one mother, this conclusion produced some concern about the "strength" of her milk during the rest of the day.

Despite references in the lay literature to the variability of breastmilk (Gaskin, 1987; La Leche League International, 1983; Minchin, 1985; Pryor, 1973), it appears that the uniqueness of breastmilk as a flexible infant food which adjusts to supply the nutrients required by the infant, both as an individual and at particular stages of growth and

development is not fully recognized by mothers. Despite suggestions in the lay literature, variations in taste of the milk related to changes in maternal diet were also not recognized by most mothers.

It is interesting to note that informants, unlike mothers in other cultures (Fildes, 1986; de González, 1963), were unsure of the effect of pregnancy and menstruation on lactation. Some considered that changes in hormones could possibly have some effect, although not necessarily an undesirable one. Researchers (Hartmann & Prosser, 1984) have observed changes in the composition of breastmilk prior to and following ovulation and throughout pregnancy, although the factors initiating these changes and the nutritional consequences the altered composition of the milk has for the infant are still unclear.

Mothers' Perceptions Related to Quantity of Breastmilk

Most informants concerns about the quantity of breastmilk are similar to expressed concerns of other breastfeeding mothers (Chapman et al., 1985; Maclean et al., 1985; Morgan, 1986). The frequency with which insufficient milk has been reported by mothers as one reason for supplementing breastfeeding with other infant foods or weaning during the first two months of breastfeeding has been described by several investigators (Clark & Beal, 1982; Ellis & Hewat, 1984; Goodine & Fried, 1984; Yeung et al., 1981), and it was often referred to by mothers in this study. Informants believed that concern about the adequacy of milk supply was a breastfeeding mother's greatest worry. Even mothers who believed that they had little direct control over the quantity of milk produced monitored their supply. While most mothers believed that insufficient milk was a "fallacy," others described their own supply as being "a little less rather than a little more," and some found it difficult to maintain the supply of milk they believed their infant required.

Assessing milk supply. Although mothers in this study felt fairly confident about their evaluations of milk supply, professional experts have questioned the validity of mother's perceptions. Greiner, Van Esterik and Latham (1981) suggest that women who believe that insufficient milk is a common phenomenon become more watchful for it. As a result,

normal physiological events experienced by the mother (e.g., cessation of leaking, lack of fullness of breasts) or fussy babies are interpreted as signs of an inadequate milk supply. Others believe that mothers are probably correct in interpreting the behavior of their fussy babies as related to hunger but incorrect in assuming that this indicates that there is something wrong with their milk or their ability to lactate (Gussler & Briesemeister, 1980). While researchers question if mother's claims of insufficient milk should be taken literally and describe insufficient milk syndrome as a "perceived" phenomenon (Tully & Dewey, 1985), it has been established that milk production and composition vary considerably under normal circumstances (Buttle, Wells, Jean, O'Brian Smith, & Garza, 1985; de Carvalho, Robertson, Merkatz, & Klaus, 1982; Neville, Keller, Seacat, Casey, Allen, & Archer, 1984; Whitehead, Hutton, Muller, Rowland, Prentice, & Paul, 1978). In addition, evidence for the transient nature of a "lactational crisis" (i.e., experiences of too little milk) has been reported by Verronen (1982) and Sjolin, Hofvander and Hillervik (1979), while Whichelow (1982) differentiates between "transistory" and "long-term" experiences. Although the actual length of time decreases in milk supply were experienced is only reported by one of these studies (Verronen, 1982), these findings suggest that mothers recognize changes in milk supply, that the experience may be temporary (e.g., four days or less) and perceived decreases in milk supply may not necessarily necessitate the cessation of breastfeeding.

While it is true that mothers can not rely on visual standards to measure the adequacy of the supply, mothers in this study appeared to have gained confidence in judging the amount of milk they produced and their infants' received through secondary sources of information. Mothers became more aware of their own bodily sensations, including let-down and changes in the fullness of their breasts, and increasingly aware of the behaviors of their infants. They also made use of "objective" criteria, such as infant weight gain and the number of wet diapers. Professional experts (Maclean, et al., 1985; Tully & Dewey, 1985) have criticized mothers' use of some cues to evaluate milk supply, such as fullness

of the breast, suggesting that granular changes in the breast and increased blood circulation that occur with the establishment of milk production cause the breasts to feel soft even when they are producing large amounts of milk. However, mothers who had been breastfeeding over eight months found there were times that their breasts were full. If they were late for a feeding, changed their pattern of feeding (e.g., to accommodate work or study commitments) or if their babies were not hungry enough to empty their breasts, they experienced breast "fullness." While they did not expect that their breasts would feel full at all times, the sensations experienced offered added reassurance that they were still producing enough milk. In addition, feeling "full" or feeling "empty" was not based entirely on tactile data concerning the breast but, more importantly, on perceptions of internal stimuli associated with the presence or absence of milk. At times, it was difficult for informants to explain exactly how they knew when their supply was "down" or "up." What is most important is that the sensations related to breast fullness, like other cues, were not viewed in isolation from the context in which they were experienced. Often, conclusions were based on a pattern of maternal and infant cues rather than simply breast "fullness" or a "fussy baby," a fact not fully recognized by other researchers (Tully & Dewey, 1985). These findings are supported by research on symptom reporting completed by Pennebaker (1982). He reports that individuals often infer their symptoms from their immediate environment. In addition, he has observed that physiological changes previously thought to be asymptomatic (for example, changes in blood pressure and blood glucose) appear to be recognized by individuals using constellations of symptoms. To explain these findings, Pennebaker hypothesized that people may not encode sensory information in the same ways that we measure it. It may be possible, therefore, that mothers are able to accurately assess changes in their milk supply without using the absolute levels that we typically measure.

In many ways, learning to depend on more indirect measures of milk supply is probably not unlike the experience of someone learning to cope with blindness.

Gradually, other ways of coming to know the world are developed through the increased sensitivity of other senses (Allen, personal communication, 1988). In an attempt to identify how much milk the infant is receiving, mothers become more attentive to their own physical sensations related to lactation and to their infant's feeding behaviors that seem to make a difference in relation to feeding outcomes. The complexity of the task is increased with the need to learn an infant's individual temperament or behavioral styles of responding to life events, including feeding, while taking into account variations in maturity of physiological systems (Pridham, 1981). However, the frequency of feeding events during the initial weeks of breastfeeding enhance the opportunity for learning. In addition, Virden (1988) suggests that experiences such as breastfeeding that facilitate the reciprocal interaction between mother and infant provide a basis for developing a stronger sense of knowing an infant and may, therefore, help a mother to develop confidence in her assessment.

Most mothers in this study thought they were accurate in their evaluations of their milk supply. Cues that were interpreted as meaning their supply was "down" allowed them to implement strategies they believed would increase their production again. Mothers, too, felt better being able to pinpoint some type of explanation for their symptoms and/or observed changes in their infants' behavior. As one mother said, "You always want to look for a reason when this happens [observations of changes in infant behavior] because then everything is settled in your mind" [710, 1.1]. Errors, however, could be made. Some cues may be overlooked and others exaggerated. After adopting a hypothesis that mothers believe to be relevant their bodies, they may be more likely to selectively monitor themselves and their infants for the presence of confirming sensory information. For example, one mother, who was concerned about the quality and quantity of her milk, thought that it may not be "good enough" based on observations of infant bowel patterns, seemingly ignoring the fact that her infant was larger than most babies his age. Maclean et al. (1985) have also observed that women who expressed doubts about whether they had

enough milk ignored criteria that would have indicated their supply was adequate and were, therefore, caught in a self-fulfilling prophecy. Inaccurate hypotheses about the meaning of personal or infant related observations, however, may be related to other factors. Pennebaker (1982) explains that symptoms by their very nature are ambiguous and subjective and, hence, open to a variety of interpretation. There is also a tendency to assume that "physical" symptoms are the result of physical causes, not emotional or perceptual causes. In addition, Verronen (1982) observed that mothers may interpret temporary situations of decreased production as a sign of "loosing" their milk rather than as normal transient phenomena. Cues that arise from the experience of lactation and observing a breastfed infant are often not attended to or clarified by health professionals (e.g., the difference between a "fussy" and "hungry" baby). While objective assessments of milk supply may contribute to women staying calm about shifts in their supply (Maclean et al., 1985), mothers still need to be able to make sense of their sensations and perceptions of their infant's behavior. Rather than repudiating mothers' personally constructed views of reality as being "subjective" or dismissing them on the basis of objective clinical evidence, it may be more appropriate to increase our understanding of how mothers perceive stimuli related to the quality and quantity of breastmilk and analyze the meaning of these sensations and observations.

Factors influencing milk supply. Informants' beliefs that reductions in milk supply are related to fatigue, anxiety or emotional upsets and diet are congruent with other reported research describing mothers' perceptions of causes of insufficient milk (Maclean et al., 1985; Morgan, 1986; Sjolin et al., 1979; Tully & Dewey, 1985; Verronen, 1982). Other reasons were also mentioned, such as frequency of nursing, mother's attitude and the ability and desire of the infant to nurse. At one level, all mothers believed wholeheartedly in the principle of 'supply equals demand' and translated this into the rule that more frequent feedings would increase the production of milk. Yet, some of these mothers often had problems maintaining their supply or "keeping up" to the baby's

demands, while others were able to maintain their supply breastfeeding two or three times per day. Empirical evidence supporting the notion of a supply and demand cycle has been conflicting. In part, problems encountered in obtaining accurate measures of milk production may explain this. Brown, Black, Robertson, Akhtar, Ahmed and Becker (1982) report that the duration of suckling and frequency of feedings are both independently associated with higher levels of milk production using 12 hour test weighing procedures. However, other researchers have observed that variations in milk production for any given infant age are unrelated to the frequency of feedings using similar 12 hour test weighing (Whitehead, et al., 1978) and 24 hour test weighing procedures (Buttle et al., 1985; de Carvalho et al., 1982). Evidence that the relationship between frequent feedings and milk production may change over the duration of breastfeeding has been demonstrated by de Carvalho, Robertson, Friedman and Klaus (1983). These researchers report that frequent and unrestricted breastfeeding stimulated a faster increase in milk output during the first two weeks postpartum, however, by the 35th postpartum day milk production was not significantly related to feeding frequency.

These findings have led some researchers to consider the role of the infant in determining lactation performance. For example, Dewey and Lonnerdal (1986) and Whitehead et al. (1978) report that infant demand for milk is highly individualized, with some "overweight" infants stimulating a large supply and gaining even more weight, while "underweight" infants demand less and hence grow less rapidly. Although heavier babies have been observed to nurse longer and more frequently in the first two weeks of life, it is not clear if additional suckling time is important to maintaining milk supply (de Carvalho et al., 1982).

The influence of the mother's role in determining lactation performance has also been considered. Quandt (1985) observed that even though all mothers claimed to be using demand feeding, some of them fed their babies more frequently than others. It is also possible that the lactational capacity of a woman may serve as a determinant of feeding

patterns. For example, Butte et al. (1985) postulate that a low rate of milk production may be associated with frequent feedings due to the insatiability of the infant. While some support for increasing the frequency of feedings during periods of perceived insufficient milk has been established by Houston (1984) and Verronen (1982) this intervention needs to be tested using a quasi-experimental design. In conclusion, there appears to be as much empirical evidence to support mothers' beliefs that they can influence the amount of milk that is produced as there is to support beliefs that that supply may be determined primarily by factors related to infant demand and individual lactational capacity.

Several mothers believed that breast expression was necessary to maintain their supply when feedings were missed. This belief, however, was not always helpful. Most mothers found it difficult to express or too time consuming, a finding supported by others (Morse & Bottorff, in press). Other informants found that after lactation was established breast expression was not necessary when they were away from their babies. They were able to continue breastfeeding using patterns of mixed feeding similar to those described by Morse and Harrison (1988). The experience of these mothers parallels other observations of methods of breastfeeding used by Canadian women (Morse, Harrison, & Prowse, 1986) and women in Third World countries (Gussler & Mock, 1983; Morse, 1984). These reports document successful breastfeeding experiences based on nursing as infrequently as once or twice a day without breast expression. This evidence serves to question the belief that regular stimulation and emptying of the breast is important for maintaining lactation.

Most mothers believed that increases in fluid intake will result in an increase in milk supply, a belief commonly held by breastfeeding mothers (Dearlove & Dearlove, 1981; Filer, 1975; Nichols & Nichols, 1981; Tully & Dewey, 1985). Although relatively few studies have been completed that measure the effect of maternal fluid intake on milk supply, little support for this belief has been demonstrated (Dusdieker, Booth, Stumbo, & Eichenberger, 1985; Horowitz, Higgins, Graham, Berriman, & Harding, 1980; Illingworth & Kilpatrick, 1953). Findings by Illingworth and Kilpatrick (1953) indicate

that forced fluids may even suppress milk production. Yet, methodological difficulties in all of these studies preclude denying the validity of mothers' experiences on the basis of scientific evidence. It may be that if water intake is restricted during lactation, decreases in other water losses through body functions (e.g., urine) occur before water for lactation is diminished (Lawrence, 1980). One informant's observations that she became constipated when she was too busy to drink as much as she usually did supports this notion.

Virtually every culture has named particular foods or drinks for nursing mothers in the belief that they increase milk supply. Beer was the most frequently mentioned lactogen among informants of this study. Only one mother used herbal preparations of fennel and raspberry tea to increase her milk supply. The pharmacological effects of these substances may be responsible for increased production, although Jelliffe and Jelliffe (1978) believe that it is more likely that these substances simply increase confidence and, therefore, ability to relax. This, in turn, results in an increased flow of milk as the let-down relax is more effective. Mothers tended to agree that the relaxation effect of these substances was important, but they also believed that the subsequent increase in milk supply may be simply due to the increased intake of fluids when mothers consume these beverages. While some informants believed that the Vitamin B in beer directly influenced the production of milk, Pryor (1973) suggests that the popularity of Vitamin B-rich substances, such as beer, during lactation relate more to their effect on the "nursing mothers' syndrome" of fatigue, irritability and depression. With improvements in mood and appetite due to Vitamin B, a mother finds that her milk supply simultaneously increases. However, there is some evidence that Vitamin B_6 may inhibit lactation (Neville & Neifert, 1983). Caution that the use of B vitamin supplements, especially premenstrual medications containing high doses of Vitamin B_6 or consumption of large quantities of brewer's yeast may led to problems has been included in at least one publication for mothers (see, Minchin, 1985).

Several mothers observed that they were able to breastfeed successfully despite being under considerable stress. Changes in supply or the flow of milk when they were anxious, busy or worried about small problems did not occur. One mother's comments that breastmilk is "tougher than we think" reflects their experience. These women were concerned that insistence on total relaxation as a necessary precondition for successful nursing may be inaccurate. These beliefs and experiences contrast with folk experience that indicates psychological factors can cause a mother's milk to dry up rapidly (Jelliffe & Jelliffe, 1978) and with literature that describes the role of stress on the mother in determining her ability to breastfeed (Jelliffe & Jelliffe, 1978; Newton & Newton, 1948; Princeton, 1986; Quandt, 1986; Sjolin et al., 1979; Verronen, 1982). Mothers who breastfed during periods they perceived as stressful attributed their success to being relaxed while nursing, being confident in their ability to produce milk or being determined to breastfeed. It may be possible that anxiety which is directly related to one's ability to nurse or to mother interferes with lactation, while anxiety experienced in other parts of one's life has less effect. It is also possible that physical factors, such as duration of suckling, adequacy of sucking stimulus or physical fatigue, may be more significant than the amount of stress or anxiety experienced in determining breastfeeding success. As Minchin (1985) suggests, it may be counterproductive to set unrealistic standards of emotional well-being, as anything less may create destructive anxiety.

Finding a Balance

Mothers who breastfeed searched for balance in their experience of lactation and nursing. They tried to ensure there would be enough milk, yet they tried to avoid the discomfort of too much milk. Some tried to eat a nutritious diet without rigidly restricting themselves to "meat and potatoes." Still others found ways to continue nursing while they continued their involvement with other facets of their life and balanced inconveniences, such as leaking, against present and long-term emotional and physical benefits of breastfeeding for both mother and baby. Although these successes are not unfamiliar, it

appears that women who are unable to find these kinds of balances in their experience of breastfeeding may wean earlier than otherwise necessary. Yet, mothers found it difficult to articulate how they achieved this kind of balancing in their breastfeeding experience. For example one mother tried to explain it as "sorting out what works for you...[to find] your own way" [1570, 1.2]. The advice, however, is rather empty. Johnson (1987) explains that balancing is a preconceptual bodily activity that cannot be described propositionally by rules. Using the example of learning the proper balance of forces for juggling, he states, "the conscious following of rules is an impediment to balancing the forces in juggling. Instead, the juggler knows when the balance is right, knows how to make adjustments, and 'has a feel' for the patterns of bodily movement that generate the proper patterns of the balls in motion" (p. 75). Perhaps the meaning of finding a balance in the physical and emotional demands of lactation in a similar fashion emerges through acts of attempting to find a balance in breastfeeding and through related experiences of bodily equilibrium.

The Production Analogy

Although mothers could not describe the intricate physiological processes involved in lactation, a dominant image was reflected throughout their conversation—that of production. Mothers talked of their bodies "working" and expending a large amount of energy in order that milk was could be "manufactured" or "produced" in their breasts. When some mothers talked of their role in the production of milk, it was almost as though they were in charge of managing the whole operation. As if their bodies were like machines, mothers searched for the most efficient way possible to control and manipulate the production and release of milk. In this sense, a mother also labored.

Use of the technological model is not new or limited to lactating mothers. Although in reality our bodies are not like machines, Martin (1987) and Davis-Floyd (1988) describe how the pervasive use of mechanistic scientific metaphors of society have effectively created machine-like images of the human body and accounts for our willingness to intervene in body processes. This treatment of the human body as a machine in both the

writings and practice of Western medicine has served to reinforce this perception. The outcome of this application of technological models in relation to the experience of health care recipients has received some attention. Davis-Floyd (1988) describes vividly the implications for women giving birth. She states:

> In accordance with this metaphor, in the hospital a women's lower half is treated like a birthing machine by skilled technicians working under semiflexible timetables to meet production and quality-control demands. The most desirable product is the new social member: the baby; the new mother is a secondary by-product of this process. (p. 158)

The tendency to denigrate women's experiences of menstruation and menopause through the use of models that imply "failed production, waste, decay and breakdown" has also been recognized (Martin, 1987, p.197). However, there has been no discussion on the consequences of using mechanistic production models to understand lactation.

From a general perspective both Martin (1987) and Winner (1977) caution that it may be inappropriate to believe that complex processes that interrelate physical, emotional and mental experience can be treated as if they could be broken down and managed like other forms of production. When norms from the realm of production and technology are extended into other realms, "things have become senselessly or inappropriately efficient, speedy, rationalized, measured or technically refined....The predominance of instrumental norms can be seen as a spill over or exaggeration of the development of technical means. It is not that such norms are perverse in themselves but rather that they have escaped their accustomed sphere" (Winner, 1977, p. 230). For these reasons, feminists have objected to the production metaphors being used to describe reproduction.

Women's images of themselves and their bodies were reflected in the ordinary language women used to talk about lactation. The separation of self from the body that women describe when they talk about menstruation, menopause and birth (Martin, 1987) is also evident when informants talked about lactation. Breastmilk is spoken of as "the milk" that "comes in", "builds up" and "settles down." Rarely did mothers talk about "my milk," although there was an occasional reference to "mother's milk." Emphasis on the

principal "supply equals demand" also seemed to separate a mother from the process of lactation. One mother's comments in talking about the quality of breastmilk are particularly revealing. She said, "There is no way [to tell]. It's not like if you made it or something" [101, 2.1]. Martin (1987) suggests that the causes of this feeling of fragmentation probably relate to the use of production metaphors, "with the separation this entails (given our conception of production) between laborer and laborer, laborer and product, laborer and labor, and manager and laborer" (p.194). Occasionally mothers moved toward expressions that convey wholeness between themselves and lactation, using active verbs or imagery of integration. One mother spoke of herself as a "leaker." Others saw themselves as "breastfeeding mothers," recognizing breastfeeding and lactation as an integral part of their lives.

Throughout the interviews with mothers, two pervading themes arose. Along side statements that the breasts produce milk were statements that lactation was something that women do. On one hand milk, production was involuntary, and on the other, a women was the force which directed and controlled the production of milk. If mothers believed that lactation is just something that happens to you, then when they were unable to produce milk it was the "machinery" of their body that was at fault. They passively accepted their fate. However, if a mother viewed lactation as something she, as a person, controlled, the possibility of failed production became more threatening, and she experienced guilt when the milk was not produced in the way she believed it should be. Yet in lactation, as in birth, involuntary and voluntary processes come together. The changed hormonal balance in a women's body that sets in motion a chain of events necessary for lactation to occur is only part of the picture. In order to give the milk, a mother must be actively involved. For example, she influences the frequency with which the baby is put to nurse as well as the functioning of the let-down reflex.

Using a production model appeared to shape a mother's behavior and consciousness in subtle ways. For example, the technological model of reality colors our perceptions of

time. Davis-Floyd (1988, p.163) explains that time becomes "mechanical and linear" and "is viewed as being measurable in discrete, almost weightable units, so we say that something should take place within a specific "amount of time." This perception of time is reflected in mothers' breastfeeding experiences. Many became preoccupied with the measurement of time. For example, most were aware of the speed with which their breasts responded to suckling, and some worried if it took longer than expected. Mothers noted the time between feedings, the amount of time their infants nursed at each breast and the amount of time they slept after a feeding. They talked about the time it took milk to "come in", the time they saved by not having to fix formula, the time that breastfeeding demanded, the unpredictable timing of demand feeding and the inconvenient timing of leaking. Just like the production of any factory good, it seemed that mothers expected that lactation and feeding should occur within specific amounts of time—at the right time. When the breasts produced too little milk and failed to keep up with production timetables (feeding schedules), mothers attempted to increase the efficiency of production, for example, by drinking more fluids or eating more food. If the milk was "too slow" to be released, mothers tried to "speed up" the let-down by imagining the milk flowing down and trying to relax. The rhythm of cyclical bodily experiences of breasts filling and emptying seemed incompatible with socially organized time. Mothers found it hard to "fit" other scheduled activities in because a baby's need for milk could not be predicted with one hundred percent accuracy. Breastfeeding mothers' concern with the measurement of time has also been observed by Maclean et al. (1985); however, they offer little explanation for this preoccupation except to suggest that it is the "actual act of breast feeding which plays a major role in determining the character of the mother's time" (p. 336).

There are different ways of conceptualizing time that contrast with the perspective which treats time as linear and something to be measured. Whether observing growing plants or building a house, in some cultures, it is the way a sequence unfolds which is important and not the amount of time that elapses (Martin, 1987). Most of the world's

women do not follow calendars or use clocks when they are breastfeeding (Rapheal & Davis, 1985). Use of clocks may in fact encourage disregard for circadian rhythms and intrinsic stimuli, such as hunger, satiety, fatigue and comfort, permitting the substitution of feeding schedules for infant-initiated feeding patterns (Harrell, 1981). For many mothers, it appears that worry about the frequency of feedings or trying to find signs of regularity or rhythm in their infants' feeding behaviors serves to create unnecessary anxiety and confusion which could lead to early termination of breastfeeding (Maclean et al., 1985). The process of lactation and feeding works best without clocks and schedules. No two infants are alike, no two experiences of breastfeeding the same.

Using the production analogy also served to focus mothers' attention on the product—the milk they produced. Mothers tried to tell whether the amount of milk produced was good enough, too much or too little and, indeed, if any milk was there at all. The influence of the dominant attitude in Western nations, including Canada, that animal milk is indispensable for growing children seemed to strengthen their focus on the milk. They believed that the primary reason and sole purpose of breastfeeding was to provide milk. Mothers felt responsible for their babies' survival and, therefore, the success of their production. Instrumental values of measurement, speed and efficiency brought concern and worry for mothers. Comparisons with other mothers were made to judge the efficiency of their milk production. Mothers noticed that some babies seemed to grow fat quickly on breastmilk while others did not, that some mothers had "tons" of milk while others had "none to spare," that some mothers could produce milk with relative ease while others felt exhausted, and that some mothers had to wait longer than others for their milk supply to "build up." The virtues of slow "information processing" and labor appear to be sacrificed for speed and efficiency. When mothers evaluated their milk production to be less than expected they often blamed themselves. As it was impossible to measure the amount of milk a baby was receiving, to "make sure" the baby was getting enough, babies were weighed with regularity and comparisons were made with growth norms. Individual

differences in growth patterns were not considered as important as the baby's ability to keep up with the normal curve.

Pryor (1973) explains that when the giving of milk becomes paramount a mother then becomes concerned about the quality and quantity of milk. Because milk is often not seen, doubts about milk supply arise. The thin pale droplets of milk observed look inferior to the milk she can prepare from a can. A mother also assesses the infant to decide if the baby has had enough or is not hungry and offers the breast only when more food is thought to be demanded. However, in more traditional cultures where the major purpose of breastfeeding is to keep a baby comfortable and happy rather than to get milk into the child, mothers "don't worry about when the baby ate last, or whether the breast seems full or empty....If he cries, she offers the breast; if he gets hiccups or bumps his head, or feels shy of a stranger, she offers the breast. In the process, the baby gets all the milk he needs, but the milk is incidental" (Pryor, 1983, p. 142).

Production in any factory is continually assessed to ensure standards are met both in terms of quality and quantity. For mothers who believed that they had some control over the quality and/or quantity of the milk produced, there seemed to be increased uncertainty about milk production. Mothers were faced with the difficulty of trying to manage something they could not measure objectively and precisely, at least in a scientific sense. However, despite the fact that mothers found other ways of evaluating their milk production that were based on less "scientific" measurements, others, including mothers themselves, question the accuracy of these judgements. Attitudes about the value of knowledge, depending on its source, may in part explain this. Sandelowski (1988, p.41) explains that with the advent of techniques such as ultrasonography, amniocentesis and fetal monitoring "woman-generated knowledge is increasingly relegated to the realms of subjectivity and ambiguity, while machine-generated knowledge is confidently located in the realms of objectivity and certainty." With the increasing use of machines in obstetrical care, women have lost confidence in the information their bodies can provide. Perhaps the

use of the production analogy by lactating mothers, with its strong overtones of technology and machines, serves to undermine women's confidence in the "soft" data they gather and use by implication alone.

Women's attempts to find less mechanistic approaches to childbirth and infant feeding seem to be thwarted by the use of production analogies. Concern with overmechanization and the unnaturalness of modern urban life have caused both men and women to search for new life styles that reflect more "natural" ways of living. The "naturalness" of breastfeeding and breastmilk is, therefore, appealing. However, an unintended side-effect of using a production analogy may well be to minimize the significance of the multidimensional interactions and emotional experiences which are so much a part of the "naturalness" of the process of lactation and breastfeeding for both mother and infant. As with any kind of food or feeding, there are deep and subtle psychological overtones, meanings and consequences that need to be recognized. Any conceptualization of lactation and breastfeeding needs to be able to accommodate this in a way which verifies women's experiences.

Implications

Nursing Practice

Many implications can be drawn from the findings of this study for nursing practice. There is evidence in this study that mothers have learned much about the biomedical benefits of breastmilk for their infants. Providing more information about the value of breastmilk, as suggested by some experts (Berg, 1977; Yeung et al., 1981; Weinstein, 1980), is likely to have little effect on patterns of breastfeeding. However, some informants were concerned about the appearance of their breastmilk. The fact that infant formula more closely resembles the appearance of cow's milk than breastmilk is noteworthy. Most artificial foods look like the food they are attempting to copy. It appears that the creamy thick yellow appearance of infant formulas may be influencing mothers perceptions of what constitutes a "proper" milk for babies. If this is the case then

consideration should be given to encouraging infant formula companies to manufacture infant formulas that look more like breastmilk. In the meantime, mothers need to be given detailed explanations regarding the appearance of breastmilk, similar to those presented by Woessner et. al.(1987). Opportunities to see samples of expressed breastmilk should also be included to reinforce this learning. Teaching mothers about the normal changes in breastmilk during a feeding may also help to decrease anxiety about the appearance of their milk. Mothers can be encouraged to express milk before and after a feeding to observe the differences between fore- and hind-milk. Infant formula companies could be encouraged to focus on how formulas are different from breastmilk rather than emphasizing only the similarities.

It is clear that mothers have also learned a great deal about lactation and its management from their own experiences, reading, health care professionals and talking to other mothers. Yet despite the homogeneity of this group, variations in beliefs have been observed. This finding supports the need to elucidate mothers' knowledge base and system of beliefs regarding breastmilk and lactation prior to implementing programs to encourage and maintain breastfeeding. Interventions can then be adjusted to specific individual situations. Beliefs that support continued lactation can be made salient and reinforced, while those which are innocuous or neutral (e.g., drinking herbal preparations) can be overlooked. Beliefs that are unfavorable according to current scientific evidence or perceived barriers to breastfeeding require closer attention. While it is simple to say that these beliefs need to be reduced, modified or replaced, effective techniques to change practices where such vital matters as the life of a child are at stake, without denigrating mothers' beliefs and practices, have yet to be identified (Fernandez & Guthrie, 1984). The interview technique of "negotiation" described by Katon and Kleinman (1981) offers promise as one way to interact with clients when conceptual differences exists between the patient and health professional. Using this approach, greater understanding of both perspectives is facilitated and provision is made for dialogue and negotiation. New

information provided within this kind of interaction may be perceived as less threatening. In addition, Gabriel et al. (1986, p.508) suggest that it is important that authoritarian attitudes on the part of health professionals, including the view that it is "'them' who lack knowledge versus 'us' who possess it," change to reflect respect of a woman's beliefs and choices. The kind of interaction being proposed by Katon and Kleinman (1981) facilitates a more equitable relationship between mothers and health professionals, which could provide the basis for demonstration of this respect. The usefulness of this approach in negotiating changes in practices related to lactation needs to be tested in clinical practice.

Although mothers saw a direct relationship between their dietary and other health practices and good lactation, for some, the stringent guidelines they attempted to follow caused a great deal of concern. While changes in health practices should be encouraged for the well-being of mothers, beliefs that rigid adherence to particular practices is necessary to produce sufficient amounts of "good" milk may be counterproductive. For example, there is little evidence of immediate deterioration in the quality of breastmilk when a mother's eating habits are poor, although changes in quantity of milk produced have been associated with more severe instances of malnutrition. Mothers who force feed themselves while breastfeeding may, in fact, be jeopardizing their own health. The health of infants may also be affected. Guilt and worry created by setting unrealistic standards may lead mothers to substitute formula unnecessarily, terminate breastfeeding earlier than may otherwise be necessary or not consider breastfeeding at all. Health professionals need to be cognizant of the kind of messages they are giving mothers and how these messages are being interpreted. Promotion of strict rules, such as no smoking, no drinking, strict attention to good eating habits and the necessity to be relaxed at all times, may discourage all but the very committed from breastfeeding. Fostering a more flexible and realistic perspective of health practices required during lactation is important. Perhaps emphasis needs to be given to the fact that health practices necessary for lactation differ from those recommended during pregnancy. Direct support of a mother's ability to nurse and teaching her how to

relax while breastfeeding may be the most effective ways to mitigate the influence of stress and anxiety on lactation. Finally, health professionals need to be more honest in their teaching and present a more balanced view. For example, mothers should be told that using breastmilk as an infant food may be both convenient and inconvenient.

As breastfeeding mothers cannot rely on precise visual indicators of exactly how much milk a baby is receiving at a particular feeding, they need to learn other ways of knowing their baby has received enough milk. While the lay literature emphasizes the use of objective measurements, such as the number of wet diapers and infant weight gain, to enhance confidence in milk supply, it is important to recognize that mothers also use a mirad of more subjective cues and observations. Health professionals need to learn more from experienced mothers about how they recognize changes in their milk production. Experienced breastfeeding mothers could also be encouraged to teach new mothers how to become more aware of feelings and sensations associated with the physiological changes that occur during lactation. This would assist new mothers in learning to use these cues more effectively and perhaps reduce their errors in interpreting them. In addition, teaching interventions with mothers should facilitate mothers' attempts to recognize and interpret infant behaviors associated with feeding.

While use of a production analogy to understand lactation is not surprising given the pervasiveness of production and technological models throughout our society and may be helpful to mothers, the limitations of using this analogy should be recognized. Specific strategies should be incorporated into teaching programs to mitigate the influence of technological values on lactation and breastfeeding. For example, innovative methods need to be developed to teach mothers how to recognize and interpret the cues of their infants so that breastfeeding can be patterned on the basis of an infant's needs rather than by the clock. Other ways of understanding lactation that encompass the relational and emotional aspects of breastfeeding should also be emphasized.

Mothers may also need some assistance in dealing with their own physical experiences of lactation. For example, leaking was viewed as an inconvenience for most mothers. However, some mothers had learned to accept leaking as a part of their breastfeeding experience and developed some useful strategies to eliminate the "mess" and embarrassment that is associated with it. This experiential knowledge needs to be shared with new mothers. Another difficulty most mothers experienced was with breast expression. This had direct implications for their own physical comfort and their freedom to leave their infants. This study supports the need for more effective teaching approaches aimed at increasing mothers' ability to express and to understand the feelings that accompany this activity (Morse & Bottorff, in press). Finally, many mothers may want to discuss feelings related to the sexual aspects of lactation and breastfeeding. Nurses should recognize that current public attitudes toward breastfeeding may interfere with mothers accepting these feelings. Mothers need to be reassured that sexual feelings associated with breastfeeding are normal, and they should be encouraged to explore alternative ways of understanding these experiences.

Future Research

Several implications for future research arise from this study. Further research is needed to identify and describe the perceptions related to breastmilk of other groups of women in Canada, including ethnic minorities as well as the economically disadvantaged. This replication would assist in identifying important similarities and differences in beliefs related to breastmilk both within and between cultural subgroups. Other areas of study that would contribute to and broaden the findings of this study include investigating the perceptions of significant family members (e.g., husbands and grandmothers) as well as women who choose to bottle feed their infants.

Descriptions of the cognitive dimensions of culture do not predict the actual behavior of individuals. However, they do provide understanding related to what is considered appropriate or expected. The role of beliefs and attitudes in structuring behavior related to

infant feeding and weaning practices warrants further investigation. Prospective studies examining food beliefs, which include observational data of actual feeding patterns collected on a regular basis over the course of a child's first year, would provide the opportunity to see how actual practices coincide with or contradict cultural beliefs. Such studies which focus on the beliefs and practices of women in developed countries are notably absent from the literature. There is evidence to suggest that individuals can change both their beliefs and their practices with respect to infant feeding over a short period of time (Pelto, 1981). Identifying the influence of other factors, including motivation (Pelto, 1981), practicality and feasibility (Adair, 1982), and economic or social factors (Pelto & Pelto, 1978), on beliefs and practices related to infant feeding would also extend our knowledge.

A better understanding of how mothers assess the adequacy of their milk supply in relation to quality and quantity could be facilitated through further research. For example, investigating the cues which prompt mothers to believe their milk is "down," "insufficient," "building up," or "good enough" is important for identifying patterns of cue perception, the significance attributed to different cues or patterns of cues, how these cues are interpreted in relation to factors believed to influence breastmilk and which assessment strategies are likely to result in more accurate judgements. The influence of a schemas or expectations (e.g., insufficient milk) on how a mother organizes cues also needs to be addressed. Since little is known about the cues that mothers use, inductive methods are indicated. Such studies, in combination with studies designed to measure perceptions of various actual stimulus events (as opposed to perceived) and changes in physiological activity associated with lactation, would add considerably to our understanding.

Mothers' perceptions of their influence over the quality and quantity of milk production also warrants further study. The first task is development of an instrument to measure attitudes and beliefs related to perceived influence over milk production. Items should be derived from qualitative data. When the instrument has been validated and reliability

established, a series of studies could be conducted to explore the relationship between perceptions of influence over milk production and other aspects of breastfeeding, including patterns of nursing, the timing of introduction of solid foods, duration of breastfeeding and patterns of weaning.

Studies examining the physical and emotional experience of leaking breastmilk are notably absent from the literature. Since leaking is a significant concern for many breastfeeding mothers, more work needs to be directed to understanding how mothers deal with the everyday problems that are associated with leaking, how they learn to accept leaking and the significance that leaking has in relation to their experience of breastfeeding as a whole.

Finally, the influence of analogies in understanding lactation and breastfeeding on women's experiences merits further investigation. Experiences of breastfeeding women from other economic and social positions could be sought to identify if and how analogies are used and their influence on women's experiences. In doing so, alternative visions based on their different life experiences may be uncovered.

Summary

This study examined belief systems related to breastmilk from the perspective of breastfeeding mothers. Researchers studying infant feeding in developed countries have largely ignored mothers' perceptions of breastmilk. Investigations have focussed on describing maternal beliefs, attitudes and concerns related to breastfeeding or identifying a wide variety of factors associated with initiation, maintenance and early termination of breastfeeding. However, investigations of the belief systems of women in traditional societies indicate that a variety of beliefs related to breastmilk are held and that these beliefs can have an important influence on breastfeeding practices. Research among Canadian women that examines ideologies surrounding the use of breastmilk, including the benefits of breastmilk and factors thought to influence the quality and quantity of human milk, has been virtually absent. The ethnoscience method was used to describe the belief systems of

mothers related to breastmilk. Interviews with nine mothers who had the experience of breastfeeding were the major source of data.

The findings from this study indicate that mothers hold significant beliefs related to breastmilk as a food and the process of lactation as a body function. Mothers' descriptions of breastmilk indicated their awareness of the biomedical benefits of breastmilk for their infants; however, several mothers were concerned about the appearance of their milk. Variations in quantity appear to be closely monitored by mothers. For most mothers, the quality of milk is assumed to remain relatively stable throughout their breastfeeding experience. However, some mothers believed that the maintenance of strict health practices, particularly related to diet, was necessary to ensure the milk was "good." Areas of contradiction in mothers' attitudes toward breastmilk were identified. Mothers' perceptions of their role in managing their milk supply were elucidated and included: 1) mothers' perceived influence over the quality and quantity of their milk, 2) ways to influence the quantity of milk, 3) ways to influence the quality of milk, 4) working on finding a balance, 5) dealing with drips, and 5) relieving the discomfort of milk. Finally, the perceived emotional and physical costs and pay-offs of producing and giving breastmilk were described.

The findings from this study are consistent with other investigations completed in traditional societies in that breastfeeding mothers were found to hold significant beliefs related to breastmilk. New insight gained by understanding mothers' perspectives of the benefits of breastmilk and factors influencing its quality and quantity could be used to guide changes in a variety of interventions aimed at supporting and maintaining breastfeeding. Developing culturally appropriate interventions can contribute to the well-being of both mothers and babies.

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APPENDIX A

CONSENT FORM FOR PARTICIPATION IN RESEARCH PROJECT

Project: Breast Milk: The Emic Perspective of Mothers

Investigator: Ms. Joan L. Bottorff, Master of Nursing Candidate
Faculty of Nursing, University of Alberta

Faculty Advisors: Dr. J. Morse and Dr. V. Bergum (phone 432-6246)

Explanation of Project:

The purpose of this research project is to interview mothers to obtain their views of the benefits of breast milk and factors they have found that influence the quality and quantity of breast milk. Your involvement in the project will include 2-4 tape recorded interviews arranged at a time and place convenient to yourself. These interviews will take about one hour each.

There will be no risk in your involvement and all information will be used so you cannot be identified. All tapes, written notes and transcripts of interviews will be numbered and stored in a locked cupboard. Your name will not appear in any reports. The tapes will be erased and the transcripts destroyed when no longer needed for my ongoing research and unless I have agreed separately on another consent form that they will be kept for educational purposes.

You have no obligation to participate in this study. If you decide to participate, it is understood that you may withdraw from the study at any time without penalty. During the course of the interviews, if you do not wish to answer any questions you may refuse.

While you may not benefit directly, the findings of this study may provide valuable information which could be used in helping other breastfeeding mothers.

Consent:

This is to certify that I, _____(print name) hereby agree to participate as a volunteer in the above named project. I understand that I am free to deny any answer to specific questions or withdraw my consent and terminate my participation at any time, without penalty.

I understand that there are no benefits or risks to me by participating in this study.

Any questions that I have about the project have been answered to my satisfaction.

_____ _____ _____ _____

(Participant) (Witness/Researcher) (Date)

APPENDIX B

CONSENT FORM FOR USE OF DATA FOR EDUCATIONAL PURPOSES

THE UNIVERSITY OF ALBERTA

AUTHORIZATION, CONSENT AND RELEASE FOR RECORDING FOR EDUCATIONAL PURPOSES

Project: Breast Milk: The Emic Perspective of Mothers
Investigator: Ms. Joan Bottorff, Master of Nursing Candidate
Faculty of Nursing, University of Alberta
Faculty Advisors: Dr. J. Morse and Dr. V. Bergum

AUTHORIZATION

I hereby authorize Joan Bottorff of the Faculty of Nursing, University of Alberta to take or cause to be taken audiorecordings.

_____(participant)

CONSENT

I hereby (do/do not) consent to allow my first or given name to be associated with these recordings. I understand that protection of my identity may not be possible in using the tapes in this way. During the course of the interviews, I understand that I am free to withdraw my consent and/or terminate my participation at any time, without penalty.

RELEASE

I hereby waive all rights that I may have to any claims for payment in connection with any presentation of these recordings. This release is made with the understanding that these recordings may be used and reused with other health care professionals for educational purposes, including publication.

DATE: _____ PLACE: _____
Day Month Year

SIGNATURE: _____

WITNESS: _____